Results of Proficiency Test
Diesel B10 (10% FAME)
May 2021

Organized by: Institute for Interlaboratory Studies
Spijkenisse, the Netherlands

Author: ing. R.J. Starink
Correctors: ing. A.S. Noordman - de Neef & ing. G.A. Oosterlaken - Buijs
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CONTENTS

1 INTRODUCTION

Since 2005 the Institute for Interlaboratory Studies (iis) organizes a proficiency scheme for the analysis of Diesel B10 containing approximately 10% FAME in accordance with the latest version of EN16734 (0-10% FAME) and ASTM D7467 (6-20% FAME) every year. During the annual proficiency testing program of 2020/2021 it was decided to continue the round robin for the analysis of Diesel B10 (10% FAME).

In this interlaboratory study registered for participation:
- 70 laboratories in 37 countries in PT on regular Diesel B10 (iis21G04),
- 43 laboratories in 23 countries in PT on Total Contamination in Diesel B10 (iis21G04TC)

In total 71 laboratories in 37 different countries registered for participation in one or two PTS. See appendix 3 for the number of participants per country. In this report the results of the Diesel B10 (10% FAME) proficiency tests are presented and discussed. This report is also electronically available through the iis website www.iisnl.com.

2 SET UP

The Institute for Interlaboratory Studies (iis) in Spijkenisse, the Netherlands, was the organizer of this proficiency test (PT). Sample analyzes for fit-for-use and homogeneity testing were subcontracted to an ISO/IEC17025 accredited laboratory.
In this proficiency test the participants received, depending on the registration, one or two different samples of Diesel B10 (10% FAME), see table below.

Sample	Quantity	Purpose
#21070	1 x 1L + 1 x 0.5L	Regular analyzes
#21071	1 x 1L	Total Contamination

Table 1: samples used in Diesel B10 (10% FAME) iis21G04 and iis21G04TC

Participants were requested to report rounded and unrounded test results. The unrounded test results were preferably used for statistical evaluation.

2.1 ACCREDITATION

The Institute for Interlaboratory Studies in Spijkenisse, the Netherlands, is accredited in agreement with ISO/IEC17043:2010 (R007), since January 2000, by the Dutch Accreditation Council (Raad voor Accreditatie). This PT falls under the accredited scope. This ensures strict adherence to protocols for sample preparation and statistical evaluation and 100% confidentiality of participant’s data. Feedback from the participants on the reported data is encouraged and customer’s satisfaction is measured on regular basis by sending out questionnaires.

2.2 PROTOCOL

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report 'iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation' of June 2018 (iis-protocol, version 3.5). This protocol is electronically available through the iis website www.iisnl.com, from the FAQ page.

2.3 CONFIDENTIALITY STATEMENT

All data presented in this report must be regarded as confidential and for use by the participating companies only. Disclosure of the information in this report is only allowed by means of the entire report. Use of the contents of this report for third parties is only allowed by written permission of the Institute for Interlaboratory Studies. Disclosure of the identity of one or more of the participating companies will be done only after receipt of a written agreement of the companies involved.

2.4 SAMPLES

A batch of approximately 170 liters of Diesel B10 was obtained from a local refinery. To this batch Biodiesel B100 was added to reach a final FAME concentration of approximately 10%V/V. After homogenization 94 amber glass bottles of 1L and 94 amber glass bottles of 0.5L were filled and labelled #21070.
The homogeneity of the subsamples was checked by determination of Density at 15°C in accordance with ISO12185 on 8 stratified randomly selected subsamples.

	Density at 15°C in kg/m^3
Sample #21070-1	833.39
Sample #21070-2	833.39
Sample #21070-3	833.39
Sample #21070-4	833.39
Sample #21070-5	833.37
Sample #21070-6	833.36
Sample #21070-7	833.38
Sample #21070-8	833.38

Table 2: homogeneity test results of subsamples #21070

From the above test results the repeatability was calculated and compared with 0.3 times the reproducibility of the reference test method in agreement with the procedure of ISO13528, Annex B2 in the next table.

	Density at 15°C in kg/m^3
r (observed)	0.03
reference test method	ISO12185:96
0.3 x R (reference test method)	0.15

Table 3: evaluation of the repeatability of subsamples #21070

The calculated repeatability is in agreement with 0.3 times the reproducibility of the reference test method. Therefore, homogeneity of the subsamples was assumed.

For the preparation of the Total Contamination sample a batch of approximately 70 liters of Diesel B10 was obtained from a local refinery. To this batch Biodiesel B100 was added to reach a final FAME concentration of approximately 10%V/V.
To each empty amber glass bottle 1 mL of a fresh prepared and well shaken Arizona dust suspension was added to an empty bottle by means of a calibrated pipette. The addition was checked by weighing the bottle before and after addition. In total 61 bottles were prepared and subsequently filled up to 1L with Diesel B10 and labelled #21071.
After homogenization a random subsample was taken to verify the actual Total Contamination content together with a sample without added Arizona Dust suspension.

Depending on the registration of the participant the appropriate set of PT samples was sent on April 28, 2021. An SDS was added to the sample package.

2.5 STABILITY OF THE SAMPLES

The stability of Diesel B10 packed in amber glass bottles was checked. The material was found sufficiently stable for the period of the proficiency test.

2.6 ANALYZES

The participants were asked to determine on sample #21070: Total Acid Number, Aromatics by FIA, Ash content, Calculated Cetane Index (two and four variables), Cloud Point, Cold Filter Plugging Point (CFPP), Carbon Residue on 10% distillation residue, Ramsbottom Carbon Residue on 10% distillation residue, Copper Corrosion 3 hrs at 50°C, Density at 15°C, Distillation at 760 mmHg (IBP, 10%, 50%, 90%, 95% recovered, FBP and Volume at 250°C and 350°C), FAME, Flash Point PMcc, Kinematic Viscosity at 40°C, Lubricity by HFRR at 60°C, Oxidation Stability (stability and induction period), Polycyclic-, Mono-, Di-, Tri+- and Total Aromatic Hydrocarbons, Pour Point (Manual and Automated 3°C interval), Sulfur and Water.
The participants were requested to determine Total Contamination only on sample #21071.

It was explicitly requested to treat the samples as if they were routine samples and to report the test results using the indicated units on the report form and not to round the test results, but report as much significant figures as possible. It was also requested not to report ‘less than’ test results, which are above the detection limit, because such test results cannot be used for meaningful statistical evaluations.

To get comparable test results a detailed report form and a letter of instructions are prepared. On the report form the reporting units are given as well as the reference test methods (when applicable) that will be used during the evaluation. The detailed report form and the letter of instructions are both made available on the data entry portal www.kpmd.co.uk/sgs-iis/. The participating laboratories are also requested to confirm the sample receipt on this data entry portal. The letter of instructions can also be downloaded from the iis website www.iisnl.com.

3 RESULTS

During five weeks after sample dispatch, the test results of the individual laboratories were gathered via the data entry portal www.kpmd.co.uk/sgs-iis/. The reported test results are tabulated per determination in appendix 1 of this report. The laboratories are presented by their code numbers.

Directly after the deadline, a reminder was sent to those laboratories that had not reported test results at that moment. Shortly after the deadline, the available test results were screened for suspect data. A test result was called suspect in case the Huber Elimination Rule (a robust outlier test) found it to be an outlier. The laboratories that produced these suspect data were asked to check the reported test results (no reanalyzes). Additional or corrected test results are used for data analysis and the original test results are placed under 'Remarks' in the result tables in appendix 1. Test results that came in after the deadline were not taken into account in this screening for suspect data and thus these participants were not requested for checks.

3.1 STATISTICS

The protocol followed in the organization of this proficiency test was the one as described for proficiency testing in the report ‘iis Interlaboratory Studies: Protocol for the Organisation, Statistics and Evaluation’ of June 2018 (iis-protocol, version 3.5).
For the statistical evaluation the *unrounded* (when available) figures were used instead of the rounded test results. Test results reported as ‘<…’ or ‘>…’ were not used in the statistical evaluation.

First, the normality of the distribution of the various data sets per determination was checked by means of the Lilliefors-test, a variant of the Kolmogorov-Smirnov test and by the calculation of skewness and kurtosis. Evaluation of the three normality indicators in combination with the visual evaluation of the graphic Kernel density plot, lead to judgement of the normality being either ‘unknown’, ‘OK’, ‘suspect’ or ‘not OK’. After removal of outliers, this check was repeated. If a data set does not have a normal distribution, the (results of the) statistical evaluation should be used with due care.

The assigned value is determined by consensus based on the test results of the group of participants after rejection of the statistical outliers and/or suspect data.

According to ISO13528 all (original received or corrected) results per determination were submitted to outlier tests. In the iis procedure for proficiency tests, outliers are detected prior to calculation of the mean, standard deviation and reproducibility. For small data sets, Dixon (up to 20 test results) or Grubbs (up to 40 test results) outlier tests can be used. For larger data sets (above 20 test results) Rosner’s outlier test can be used. Outliers are marked by D(0.01) for the Dixon’s test, by G(0.01) or DG(0.01) for the Grubbs’ test and by R(0.01) for the Rosner’s test. Stragglers are marked by D(0.05) for the Dixon’s test, by G(0.05) or DG(0.05) for the Grubbs’ test and by R(0.05) for the Rosner’s test. Both outliers and stragglers were not included in the calculations of averages and standard deviations.

For each assigned value the uncertainty was determined in accordance with ISO13528. Subsequently the calculated uncertainty was evaluated against the respective requirement based on the target reproducibility in accordance with ISO13528. In this PT, the criterion of ISO13528, paragraph 9.2.1. was met for all evaluated tests, therefore, the uncertainty of all assigned values may be negligible and need not be included in the PT report.

Finally, the reproducibilities were calculated from the standard deviations by multiplying them with a factor of 2.8.

3.2 GRAPHICS

In order to visualize the data against the reproducibilities from literature, Gauss plots were made, using the sorted data for one determination (see appendix 1). On the Y-axis the reported test results are plotted. The corresponding laboratory numbers are on the X-axis. The straight horizontal line presents the consensus value (a trimmed mean). The four striped lines, parallel to the consensus value line, are the +3s, +2s, -2s and -3s target reproducibility limits of the selected reference test method. Outliers and other data, which were excluded from the calculations, are represented as a cross. Accepted data are represented as a triangle.

Furthermore, Kernel Density Graphs were made. This is a method for producing a smooth density approximation to a set of data that avoids some problems associated with histograms. Also, a normal Gauss curve (dotted line) was projected over the Kernel Density Graph (smooth line) for reference. The Gauss curve is calculated from the consensus value and the corresponding standard deviation.

3.3 Z-SCORES

To evaluate the performance of the participating laboratories the z-scores were calculated. As it was decided to evaluate the performance of the participants in this proficiency test (PT) against the literature requirements, e.g. ISO reproducibilities, the z-scores were calculated using a target standard deviation. This results in an evaluation independent of the variation in this interlaboratory study.

The target standard deviation was calculated from the literature reproducibility by division with 2.8. In case no literature reproducibility was available, other target values were used, like Horwitz or an estimated reproducibility based on former iis proficiency tests.

When a laboratory did use a test method with a reproducibility that is significantly different from the reproducibility of the reference test method used in this report, it is strongly advised to recalculate the z-score, while using the reproducibility of the actual test method used, this in order to evaluate whether the reported test result is fit-for-use.
The z-scores were calculated according to:

$$z_{(target)} = (\text{test result} - \text{average of PT}) / \text{target standard deviation}$$

The $z_{(target)}$ scores are listed in the test result tables in appendix 1.

Absolute values for z<2 are very common and absolute values for z>3 are very rare.

Therefore, the usual interpretation of z-scores is as follows:

	|z|	< 1	good
1 <	|z|	< 2	satisfactory
2 <	|z|	< 3	questionable
3 <	|z|		unsatisfactory

4 EVALUATION

In this proficiency test some problems were encountered with the dispatch of the samples. For the regular Diesel B10 PT all participants reported test results. Four participants reported test results after the final reporting date.
For the Total contamination PT two participants reported test results after the final reporting date and three other participants did not report any test results.
Not all participants were able to report all data requested. Finally, 71 laboratories reported 1351 numerical test results. Observed were 40 outlying test results, which is 3.0%. In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.

Not all original data sets proved to have a normal Gaussian distribution. These are referred to as “not OK” or “suspect”. The statistical evaluation of these data sets should be used with due care, see also paragraph 3.1.

4.1 EVALUATION PER SAMPLE AND PER TEST

In this section the reported test results are discussed per test. The test methods which were used by the various laboratories were taken into account for explaining the observed differences when possible and applicable. These test methods are also in the tables together with the reported test results in appendix 1. The abbreviations, used in these tables, are explained in appendix 4.

In the iis PT reports ASTM test methods are referred to with a number (e.g. D976) and an added designation for the year that the test method was adopted or revised (e.g. D976:06). If applicable, a designation in parentheses is added to designate the year of reapproval (e.g. D976:06(2016)). In the results tables of appendix 1 only the method number and year of adoption or revision (e.g. D976:06) will be used.

Sample #21070

Total Acid Number: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ASTM D664-B:18e2.

Aromatics by FIA: No z-scores were calculated as the precision and bias of ASTM D1319 with biodiesel blends is not known and is currently under investigation, see paragraph X1.11.1 of ASTM D7467:20.

Ash content: This determination was not problematic. All participants agreed on a consensus value <0.01. Therefore, no z-scores were calculated.

Calc. Cetane Index, two variables: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ASTM D976:06(2016).

Calc. Cetane Index, four variables: Regretfully, no reproducibility is mentioned in procedure A of ASTM D4737:10(2016) nor in the equivalent test methods ISO4264 and IP380. Therefore, iis has estimated a reproducibility for Calculated Cetane Index by Four Variable Equation based from previous iis PTs (see iis memo 1904).
This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the estimated target reproducibility over previous PTs, see iis memo 1904.

Cloud Point: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of ISO3015:19.

CFPP: This determination was problematic. No statistical outliers were observed. The calculated reproducibility is not in agreement with the requirements of EN116:15.

Carbon Residue (micro method) on 10% residue: This determination may be problematic. The consensus value of the group was below the application range of ISO10370:14. Therefore, no z-scores were calculated.

Ramsbottom Carbon Residue on 10% residue: This determination was very problematic. No statistical outliers were observed. The calculated reproducibility is not at all in agreement with the requirements of ASTM D524:15(2019). It was decided not to calculate z-scores due to the large reproducibility and the limited reported test values.

Copper Corrosion: This determination was not problematic. All reporting laboratories agreed on a test result of 1 (1A).

Density at 15°C: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12185:96.

Distillation at 760 mmHg: This determination was not problematic. In total ten statistical outliers were observed over eight parameters. All calculated reproducibilities after rejection of the statistical outliers are in agreement with the requirements of the automated mode of ISO3405:19. When evaluated against the requirements of the manual mode of ISO3405:19 only the calculated reproducibilities for IBP, 95% rec. and FBP after rejection of the statistical outliers are not in agreement.

FAME: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN14078-B:14 and in agreement with ASTM D7371:14.

Flash Point PMcc: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO2719-A:16.

Kinematic Viscosity at 40°C: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in full agreement with the requirements of ISO3104:20.

Lubricity by HFRR: This determination was not problematic. Two statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12156:18 mode A (Digital Camara) and mode B (Visual).

Oxidation Stability: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO12205:95.

Oxidation Stability induction period: This determination was problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is not in agreement with the requirements of EN15751:14.

Polycyclic Aromatics: This determination was problematic for a number of laboratories. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN12916:19.

Mono-Aromatics: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN12916:19.

Di-Aromatics: This determination was not problematic. One statistical outlier was observed. The calculated reproducibility after rejection of the statistical outlier is in agreement with the requirements of EN12916:19.

Tri+-Aromatics: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of EN12916:19.

Total Aromatics: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN12916:19.

Pour Point Manual: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO3016:19.

Pour Point Automated: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ASTM D5950:14(2020).

Sulfur: This determination was not problematic. No statistical outliers were observed. The calculated reproducibility is in agreement with the requirements of ISO20846:19.

Water: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of ISO12937:00.

Sample #21071

Total Contamination: This determination was not problematic. Three statistical outliers were observed. The calculated reproducibility after rejection of the statistical outliers is in agreement with the requirements of EN12664:14.

4.2 PERFORMANCE EVALUATION FOR THE GROUP OF LABORATORIES

A comparison has been made between the reproducibility as declared by the reference test method and the reproducibility as found for the group of participating laboratories. The number of significant test results, the average, the calculated reproducibility (2.8 * standard deviation) and the target reproducibility derived from literature reference test methods (in casu ASTM, EN and ISO test methods) are presented in the next table.

Parameter	unit	n	average	2.8 * sd	R(lit)
Total Acid Number	mg KOH/g	24	0.06	0.04	0.06
Aromatics by FIA	%V/V	11	21.2	8.6	(3.7)
Ash content	%M/M	40	<0.01	n.e.	n.e.
Calculated Cetane, two variables		25	51.80	1.00	2
Calculated Cetane, four variables		41	50.98	0.96	0.91
Cloud Point	°C	49	-8.5	2.5	4
Cold Filter Plugging Point	°C	49	-25.1	6.6	4.5
CR on 10% distillation residue	%M/M	22	0.03	0.03	(0.02)
Ramsbottom CR 10% dist. res.	%M/M	6	0.07	0.07	(0.03)

Parameter	unit	n	average	2.8 * sd	R(lit)
Copper Corrosion 3 hrs at 50°C		48	1(1A)	n.a.	n.a.
Density at 15°C	kg/m^3	64	833.4	0.3	0.5
Initial Boiling Point	°C	59	165.9	8.2	9.1
10% recovery	°C	57	192.8	4.0	4.2
50% recovery	°C	57	262.8	2.9	3
90% recovery	°C	59	335.3	4.3	5.0
95% recovery	°C	59	348.2	6.7	8.5
Final Boiling Point	°C	59	356.1	5.6	7.1
Volume at 250°C	%V/V	53	43.1	2.0	2.7
Volume at 350°C	%V/V	53	95.5	1.7	2.7
Fatty Acid Methyl Ester (FAME)	%V/V	51	9.5	0.7	0.7
Flash Point PMcc	°C	62	58.1	3.3	4.1
Kinematic Viscosity at 40°C	mm^2/s	52	2.445	0.028	0.028
Lubricity by HFRR at 60°C	µm	32	195	47	80
Oxidation Stability	g/m^3	14	3.06	7.03	7.89
Oxidation Stability induct. period	hours	24	24.2	7.2	5.0
Polycyclic Aromatic Hydrocarb.	%M/M	26	1.86	0.71	0.81
Mono-Aromatic Hydrocarbons	%M/M	26	17.5	2.4	2.2
Di-Aromatic Hydrocarbons	%M/M	25	1.65	0.53	0.51
Tri+-Aromatic Hydrocarbons	%M/M	25	0.20	0.45	0.56
Total Aromatic Hydrocarbons	%M/M	24	19.6	2.5	2.3
Pour Point Manual	°C	26	-25.9	4.7	6.6
Pour Point Automated	°C	19	-24.6	3.8	6.1
Sulfur	mg/kg	58	8.2	1.7	2.0
Water	mg/kg	49	63.6	21.0	54.8
Total Contamination	mg/kg	36	21.6	6.8	7.7

Table 4: reproducibilities of tests on samples #21070 and #21071

Results reported between brackets are for indication only because no z-scores are calculated

Without further statistical calculations, it can be concluded that for several tests there is a good compliance of the group of participating laboratories with the reference test methods. The problematic tests have been discussed in paragraph 4.1.

4.3 COMPARISON OF THE INTERLABORATORY STUDY OF MAY 2021 WITH PREVIOUS PTS

	May 2021	May 2020	June 2019	June 2018	June 2017
Number of reporting laboratories	71	63	68	66	68
Number of test results	1351	1261	1349	1343	1444
Number of statistical outliers	40	37	41	40	33
Percentage of statistical outliers	3.0%	2.9%	3.0%	3.0%	2.3%

Table 5: comparison with previous proficiency tests.

In proficiency tests, outlier percentages of 3% - 7.5% are quite normal.

The performance of the determinations of the proficiency tests was compared to the requirements of the reference test methods. The conclusions are given the following table.

Parameter	May 2021	May 2020	June 2019	June 2018	June 2017
Total Acid Number	+	+	+/-	+/-	+
Aromatics by FIA	(--)	n.e.	n.e.	n.e.	n.e.
Ash content	n.e.	+	++	++	++
Calculated Cetane, two variables	++	++	++	++	++
Calculated Cetane, four variables	+/-	+	++	++	++
Cloud Point	+	+	+	+	++
Cold Filter Plugging Point	-	+/-	+/-	-	+
CR on 10% distillation residue	(-)	(-)	(--)	(-)	(--)
Ramsbottom CR 10% dist. res.	--	-	--	-	++
Density at 15°C	+	++	++	++	+
Distillation at 760 mmHg	+	+	+	+	+
Fatty Acid Methyl Ester (FAME)	+/-	+/-	+	+	-
Flash Point PMcc	+	+	+/-	+	+
Kinematic Viscosity at 40°C	+/-	-	-	+	+
Lubricity by HFRR at 60°C	+	+	++	+/-	+/-
Oxidation Stability	+	+	+	+	+
Oxidation Stability induct. period	-	-	-	+	--
Aromatic Hydrocarbons	+/-	+	+	+/-	+
Pour Point Manual	+	-	+	+	+/-
Pour Point Automated	+	+	+	+	+
Sulfur	+	+/-	-	+	+
Water	++	++	++	+	++
Total Contamination	+	-	--	-	+/-

Table 6: comparison of the determinations against the reference test methods

Result between brackets: consensus value is below application range of the reference test method

The following performance categories were used:

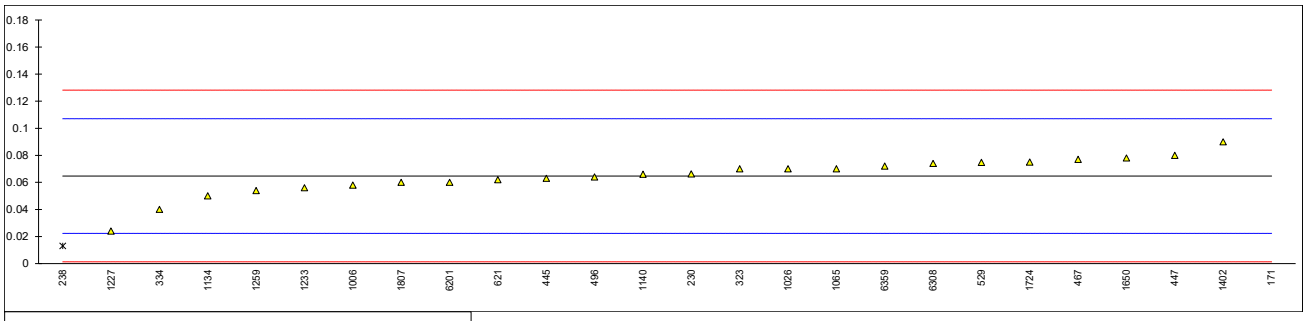
- ++ : group performed much better than the reference test method
- + : group performed better than the reference test method
- +/- : group performance equals the reference test method
- - : group performed worse than the reference test method
- -- : group performed much worse than the reference test method
- n.e. : not evaluated

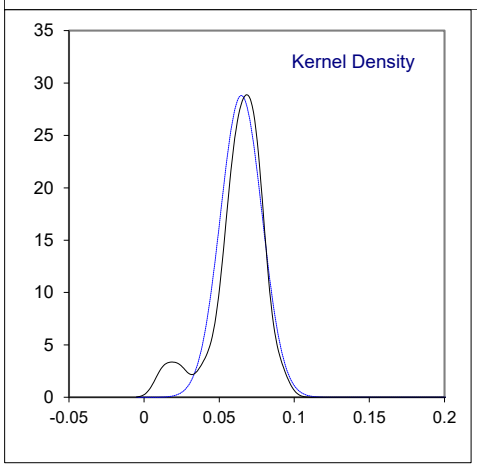
APPENDIX 1

Determination of Total Acid Number on sample #21070; result in mg KOH/g

lab	method	value	mark	z(targ)	remarks
62	D664-B	<0.1		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	D664-B	0.40	R(0.01)	15.85	
175		-----		-----	
230	D664-A	0.0662		0.07	
237	D664-B	<0.1		-----	
238	D974	0.013	R(0.05)	-2.45	
323	D664-B	0.07		0.25	
328		-----		-----	
334	D664-B	0.04		-1.17	
335		-----		-----	
338		-----		-----	
343		-----		-----	
365		-----		-----	
381		-----		-----	
445	D664-B	0.063		-0.08	
447	D974	0.08		0.72	
460		-----		-----	
467	D664-B	0.077		0.58	
496	D664-B	0.064		-0.04	
511		-----		-----	
529	D664-B	0.0747		0.47	
541		-----		-----	
603		-----		-----	
621	D664-B	0.062		-0.13	
633		-----		-----	
663		-----		-----	
1006	D664-B	0.058		-0.32	
1016		-----		-----	
1017		-----		-----	
1026	D664-B	0.07		0.25	
1047		-----		-----	
1059		-----		-----	
1065	D664-B	0.070		0.25	
1124		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134	D664-B	0.05		-0.70	
1140	D974	0.066		0.06	
1146		-----		-----	
1194		-----		-----	
1227	D664-B	0.024		-1.93	
1233	D664-A	0.056		-0.41	
1237		-----		-----	
1259	D664-B	0.054		-0.51	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	D664-B	0.090		1.19	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	D664-B	0.078		0.63	
1706		-----		-----	
1724	D664-B	0.075		0.48	
1728		-----		-----	
1807	D664-B	0.06		-0.22	
1811		-----		-----	
2146		-----		-----	
6168		-----		-----	
6201	D664-B	0.06		-0.22	
6308	D664-B	0.074		0.44	
6359	D664-B	0.072		0.34	
6370		-----		-----	
6371		-----		-----	
6373	D664-B	<0.10		-----	

normality	not OK
n	24
outliers	2
mean (n)	0.0647
st.dev. (n)	0.01385
R(calc.)	0.0388
st.dev.(D664-B:18e2)	0.02115
R(D664-B:18e2)	0.0592

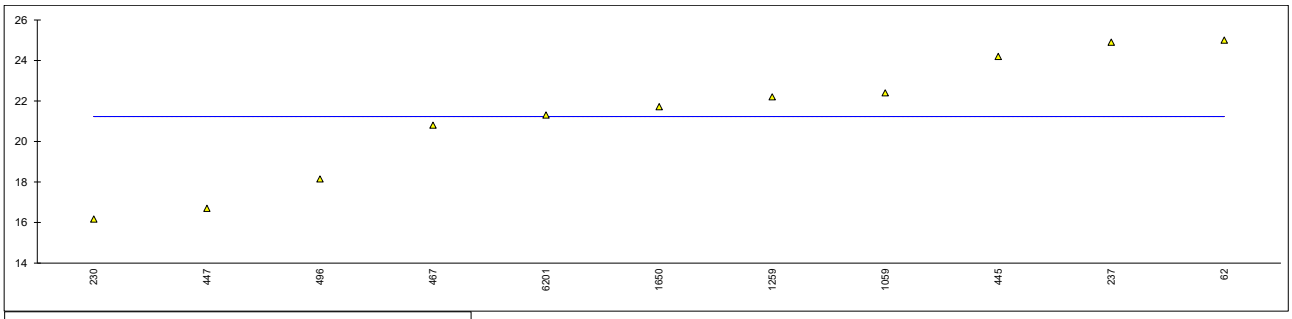


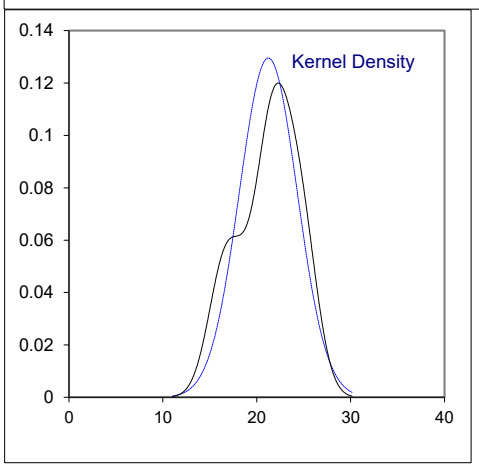


Determination of Aromatics by FIA (without Oxygenates correction) on sample #21070; result in %V/V

lab	method	value	mark	z(targ)	remarks
62	D1319	25.0		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
230	D1319	16.17		-----	
237	D1319	24.9		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
365		-----		-----	
381		-----		-----	
445	D1319	24.20		-----	
447	D1319	16.7		-----	
460		-----		-----	
467	D1319	20.80		-----	
496	D1319	18.15		-----	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026		-----		-----	
1047		-----		-----	
1059	D1319	22.4		-----	
1065		-----		-----	
1124		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1140		-----		-----	
1146		-----		-----	
1194		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259	EN15553	22.2		-----	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402		-----		-----	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	D1319	21.72		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807		-----		-----	
1811		-----		-----	
2146		-----		-----	
6168		-----		-----	
6201	D1319	21.3		-----	
6308		-----		-----	
6359		-----		-----	
6370		-----		-----	
6371		-----		-----	
6373		-----		-----	

normality	OK
n	11
outliers	0
mean (n)	21.231
st.dev. (n)	3.0798
R(calc.)	8.624
st.dev.(D1319:20a)	(1.3214)
R(D1319:20a)	(3.7)

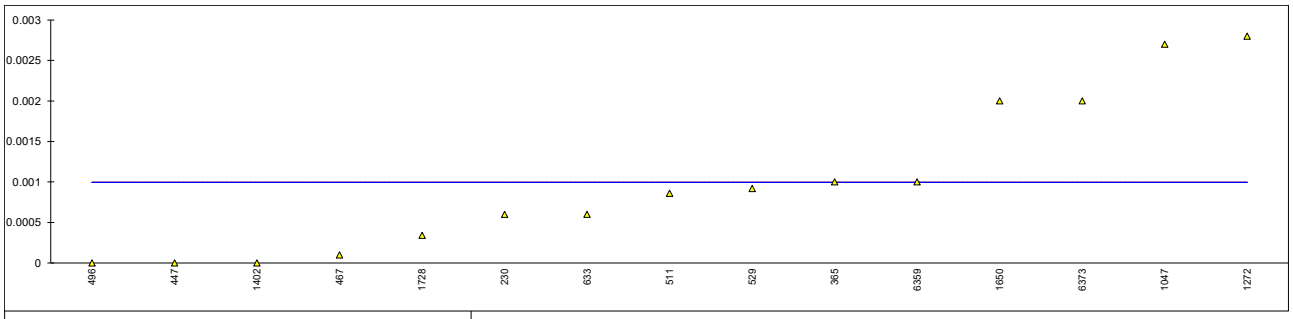


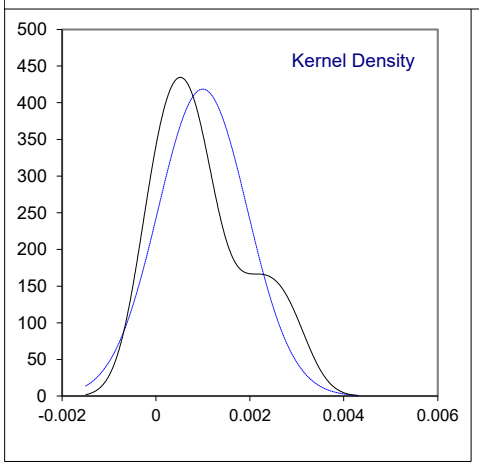


Determination of Ash content on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62	D482	<0.001		-----	
120	ISO6245	<0.001		-----	
140	D482	<0.010		-----	
150	D482	<0.001		-----	
171	D482	<0.010		-----	
175		-----		-----	
230	D482	0.0006		-----	
237	D482	<0.01		-----	
238		-----		-----	
323	ISO6245	<0.001		-----	
328		-----		-----	
334	ISO6245	<0.001		-----	
335		-----		-----	
338		-----		-----	
343	ISO6245	<0.001		-----	
365	IP4	0.001		-----	
381		-----		-----	
445	ISO6245	<0.001		-----	
447	IP4	0		-----	
460		-----		-----	
467	ISO6245	0.0001		-----	
496	ISO6245	0.000		-----	
511	D482	0.00086		-----	
529	D482	0.00092		-----	
541	ISO6245	<0.001		-----	
603	D482	< 0.005		-----	
621	D482	< 0.01		-----	
633	D482	0.0006		-----	
663	D482	<0.010		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026		-----		-----	
1047	ISO6245	0.0027		-----	
1059	ISO6245	<0,001		-----	
1065		-----		-----	
1124	ISO6245	<0.001		-----	
1126		-----		-----	
1131	ISO6245	<0,001		-----	
1134	IP4	<0.001		-----	
1140	IP4	<0.001		-----	
1146	D482	<0.001		-----	
1194		-----		-----	
1227		-----		-----	
1233	ISO6245	<0.001		-----	
1237		-----		-----	
1259		-----		-----	
1272	ISO6245	0.0028		-----	
1316		-----		-----	
1339	ISO6245	< 0.001		-----	
1389		-----		-----	
1402	IP4	0.000		-----	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	D482	0.0020		-----	
1706		-----		-----	
1724	D482	<0,001		-----	
1728	D482	0.00034		-----	
1807		-----		-----	
1811		-----		-----	
2146		-----		-----	
6168		-----		-----	
6201	ISO6245	<0.001		-----	
6308	D482	<0.001		-----	
6359	D482	0.001		-----	
6370		-----		-----	
6371		-----		-----	
6373	ISO6245	0.002		-----	

n	40
mean (n)	<0.01

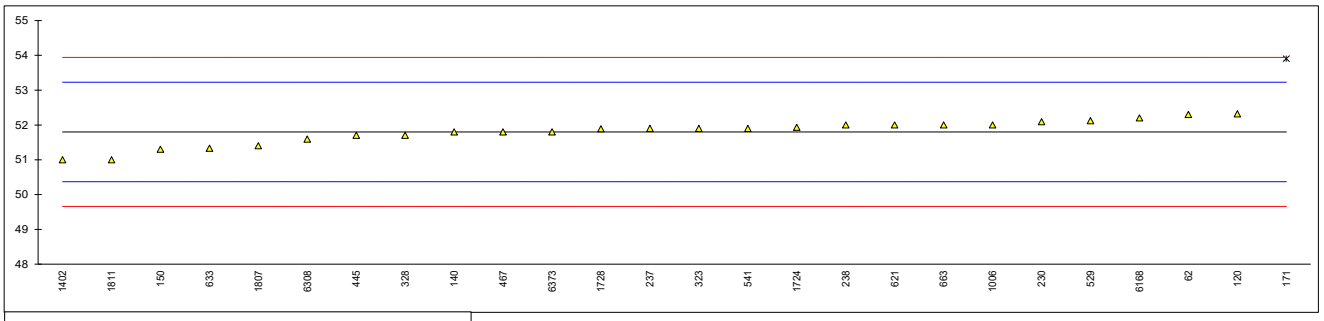


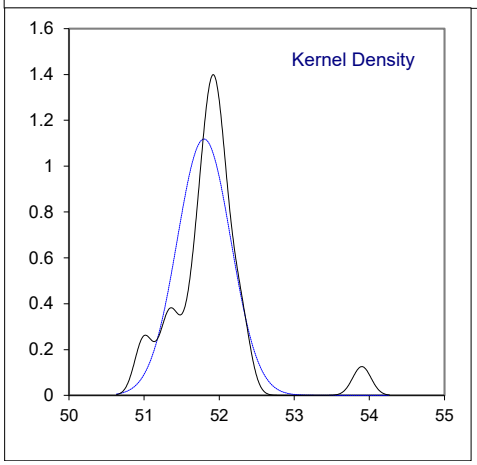


Determination of Calculated Cetane Index, two variables D976 on sample #21070

lab	method	value	mark	z(targ)	remarks
62	D976	52.3		0.70	
120	D976	52.32		0.73	
140	D976	51.8		0.00	
150	D976	51.3		-0.70	
171	D976	53.9	R(0.01)	2.94	
175		-----		-----	
230	D976	52.09		0.41	
237	D976	51.9		0.14	
238	D976	52.0		0.28	
323	D976	51.9		0.14	
328	D976	51.7		-0.14	
334		-----		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
365		-----		-----	
381		-----		-----	
445	D976	51.7		-0.14	
447		-----		-----	
460		-----		-----	
467	D976	51.8		0.00	
496		-----		-----	
511		-----		-----	
529	D976	52.12		0.45	
541	D976	51.9		0.14	
603		-----		-----	
621	D976	52.0		0.28	
633	D976	51.33		-0.66	
663	D976	52.00		0.28	
1006	D976	52.0		0.28	
1016		-----		-----	
1017		-----		-----	
1026		-----		-----	
1047		-----		-----	
1059		-----		-----	
1065		-----		-----	
1124		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1140		-----		-----	
1146		-----		-----	
1194		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	D976	51.0		-1.12	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724	D976	51.93		0.18	
1728	D976	51.89		0.13	
1807	D976	51.4		-0.56	
1811	D976	51.0		-1.12	
2146		-----		-----	
6168	D976	52.2		0.56	
6201		-----		-----	
6308	D976	51.59		-0.29	
6359		-----		-----	
6370		-----		-----	
6371		-----		-----	
6373	D976	51.8		0.00	

normality	OK
n	25
outliers	1
mean (n)	51.799
st.dev. (n)	0.3569
R(calc.)	0.999
st.dev.(D976:06)	0.7143
R(D976:06)	2

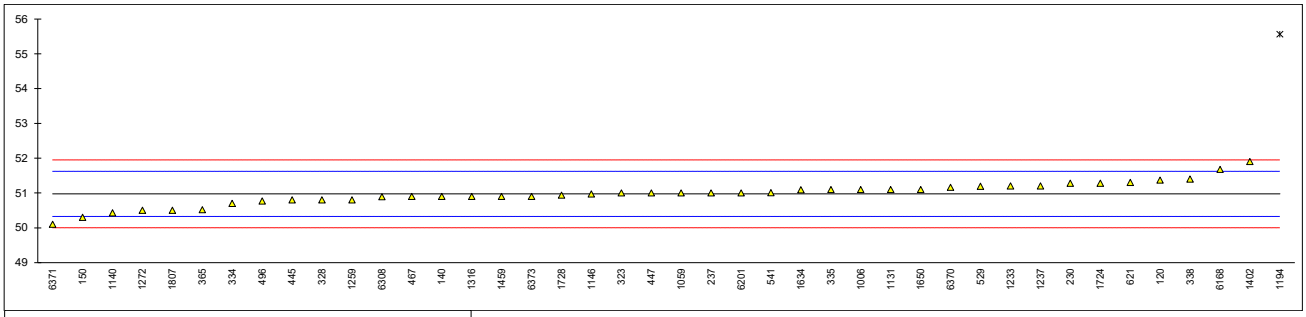


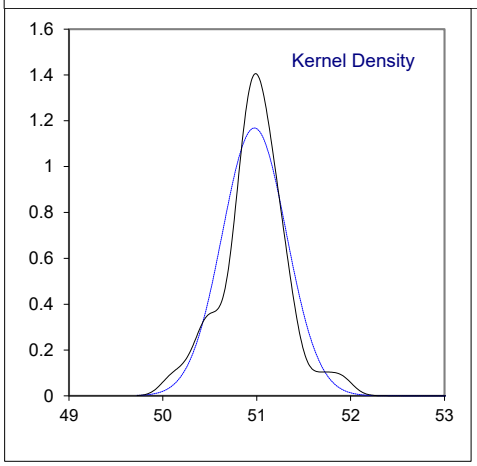


Determination of Calculated Cetane Index, four variables ISO4264 on sample #21070

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	ISO4264	51.37		1.22	
140	D4737-A	50.9		-0.23	
150	D4737-A	50.3		-2.08	
171		-----		-----	
175		-----		-----	
230	ISO4264	51.28		0.94	
237	D4737-A	51.0		0.08	
238		-----		-----	
323	ISO4264	51.0		0.08	
328	ISO4264	50.8		-0.54	
334	ISO4264	50.7		-0.85	
335	ISO4264	51.1		0.39	
338	ISO4264	51.4		1.31	
343		-----		-----	
365	IP380	50.52		-1.40	
381		-----		-----	
445	IP380	50.8		-0.54	
447	ISO4264	51.0		0.08	
460		-----		-----	
467	ISO4264	50.9		-0.23	
496	ISO4264	50.77		-0.63	
511		-----		-----	
529	D4737	51.19		0.66	
541	D4737-A	51.01		0.11	
603		-----		-----	
621	ISO4264	51.3		1.00	
633		-----		-----	
663		-----		-----	
1006	D4737-A	51.1		0.39	
1016		-----		-----	
1017		-----		-----	
1026		-----		-----	
1047		-----		-----	
1059	ISO4264	51.0		0.08	
1065		-----		-----	
1124		-----		-----	
1126		-----		-----	
1131	ISO4264	51.1		0.39	
1134		-----		-----	
1140	IP380	50.4295		-1.68	
1146	ISO4264	50.97		-0.02	
1194	D4737-A	55.56	R(0.01)	14.15	
1227		-----		-----	
1233	ISO4264	51.2		0.69	
1237	ISO4264	51.2		0.69	
1259	ISO4264	50.8		-0.54	
1272	ISO4264	50.5		-1.47	
1316	D4737-A	50.9		-0.23	
1339		-----	W	-----	Test result withdrawn, reported 52.52
1389		-----		-----	
1402	IP380	51.9		2.86	
1459	D4737-A	50.9		-0.23	
1549		-----		-----	
1550		-----		-----	
1634	ISO4264	51.09		0.36	
1650	ISO4264	51.1		0.39	
1706		-----		-----	
1724	D4737-A	51.28	C	0.94	First reported 45.97
1728	ISO4264	50.9371		-0.12	
1807	D4737-A	50.5		-1.47	
1811		-----		-----	
2146		-----		-----	
6168	D4737-A	51.677		2.17	
6201	D4264	51.0		0.08	
6308	IP380	50.89		-0.26	
6359		-----		-----	
6370	ISO4264	51.16		0.57	
6371	ISO4264	50.1		-2.70	
6373	D4737-A	50.9		-0.23	

normality	suspect
n	41
outliers	1
mean (n)	50.975
st.dev. (n)	0.3414
R(calc.)	0.956
st.dev.(iis memo 1904)	0.3239
R(iis memo 1904)	0.907

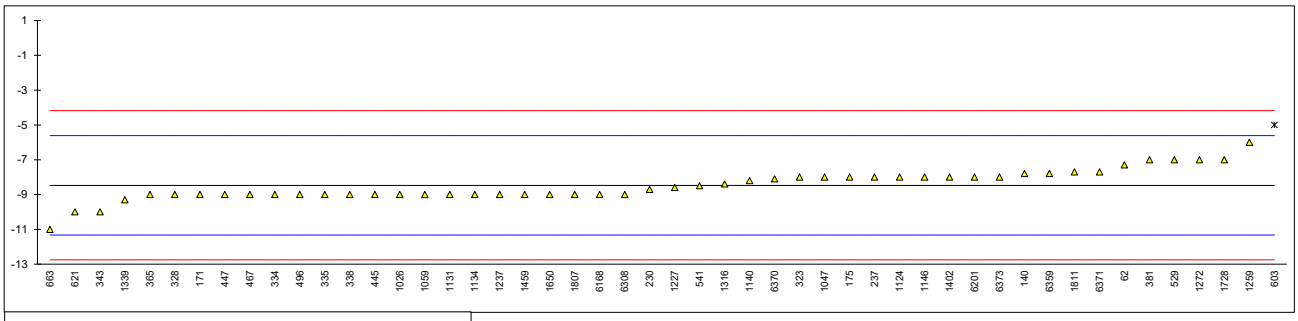


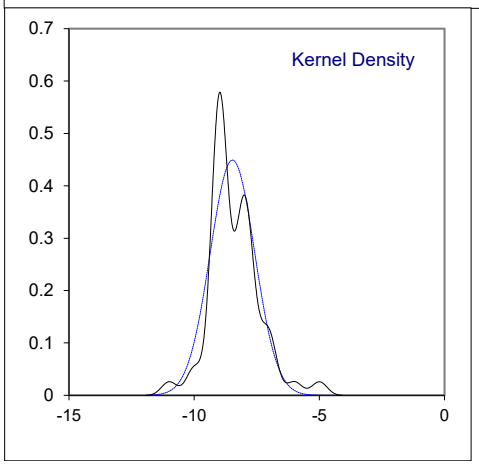


Determination of Cloud Point on sample #21070; result in °C

lab	method	value	mark	z(targ)	remarks
62	D5773	-7.3		0.82	
120		-----		-----	
140	D5773	-7.8		0.47	
150		-----		-----	
171	D2500	-9		-0.37	
175	D5771	-8		0.33	
230	D2500	-8.71		-0.17	
237	D2500	-8		0.33	
238		-----		-----	
323	ISO3015	-8		0.33	
328	ISO3015	-9		-0.37	
334	ISO3015	-9		-0.37	
335	ISO3015	-9		-0.37	
338	ISO3015	-9		-0.37	
343	ISO3015	-10		-1.07	
365	IP219	-9		-0.37	
381	ISO3015	-7		1.03	
445	D2500	-9		-0.37	
447	IP219	-9		-0.37	
460		-----		-----	
467	EN23015	-9		-0.37	
496	ISO3015	-9		-0.37	
511		-----		-----	
529	D2500	-7		1.03	
541	D5771	-8.5		-0.02	
603	D2500	-5	R(0.05)	2.43	
621	D2500	-10.0		-1.07	
633		-----		-----	
663	D2500	-11		-1.77	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026	ISO3015	-9		-0.37	
1047	ISO3015	-8		0.33	
1059	ISO3015	-9		-0.37	
1065		-----		-----	
1124	ISO3015	-8.0		0.33	
1126		-----		-----	
1131	ISO3015	-9		-0.37	
1134	IP219	-9		-0.37	
1140	D5773	-8.2		0.19	
1146	D2500	-8		0.33	
1194		-----		-----	
1227	D2500	-8.6		-0.09	
1233	ISO3015	<-12		-----	
1237	ISO3015	-9		-0.37	
1259	ISO3015	-6		1.73	
1272	ISO3015	-7		1.03	
1316	D5771	-8.4		0.05	
1339	D2500	-9.3		-0.58	
1389		-----		-----	
1402	EN23015	-8		0.33	
1459	ISO3015	-9.0		-0.37	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	D5771	-9		-0.37	
1706		-----		-----	
1724		-----	W	-----	Test result withdrawn, reported -3
1728	D2500	-7		1.03	
1807	D2500	-9		-0.37	
1811	ISO3015	-7.7		0.54	
2146		-----		-----	
6168	D2500	-9		-0.37	
6201	ISO3015	-8		0.33	
6308	IP219	-9		-0.37	
6359	ISO3015	-7.8		0.47	
6370	D5771	-8.1		0.26	
6371	D5773	-7.7		0.54	
6373	EN23015	-8		0.33	

normality	suspect
n	49
outliers	1
mean (n)	-8.472
st.dev. (n)	0.8882
R(calc.)	2.487
st.dev.(ISO3015:19)	1.4286
R(ISO3015:19)	4

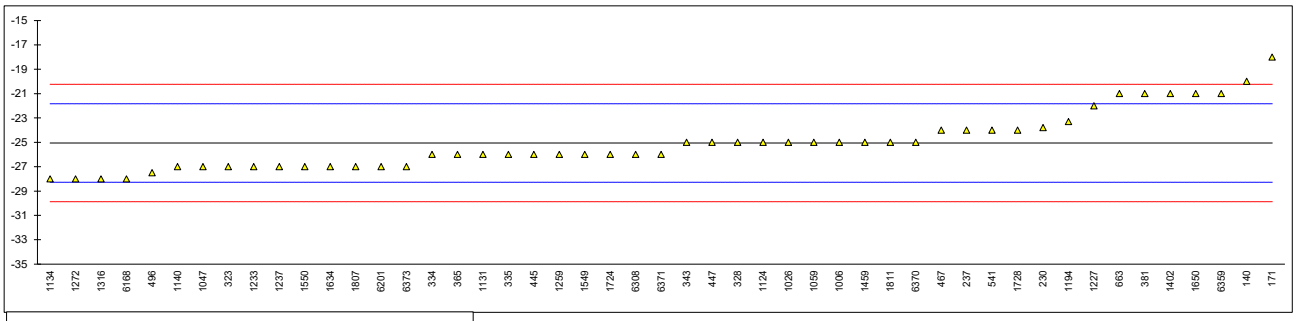


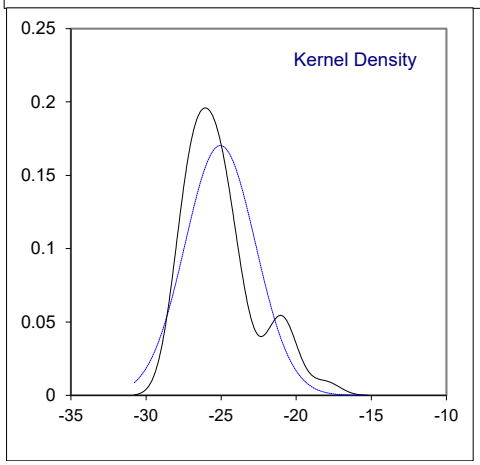


Determination of Cold Filter Plugging Point (CFPP) on sample #21070; result in °C

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140	D6371	-20		3.14	
150		-----		-----	
171	D6371	-18		4.39	
175		-----		-----	
230	IP309	-23.8		0.78	
237	D6371	-24		0.65	
238		-----		-----	
323	EN116	-27		-1.21	
328	EN116	-25		0.03	
334	EN116	-26		-0.59	
335	EN116	-26		-0.59	
338		-----		-----	
343	EN116	-25		0.03	
365	IP309	-26		-0.59	
381	EN116	-21		2.52	
445	IP309	-26.0		-0.59	
447	IP309	-25		0.03	
460		-----		-----	
467	EN116	-24		0.65	
496	EN116	-27.5		-1.52	
511		-----		-----	
529		-----		-----	
541	D6371	-24		0.65	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663	EN116	-21		2.52	
1006	D6371	-25		0.03	
1016		-----		-----	
1017		-----		-----	
1026	EN16329	-25		0.03	
1047	EN116	-27		-1.21	
1059	EN116	-25		0.03	
1065		-----		-----	
1124	EN116	-25.0		0.03	
1126		-----		-----	
1131	EN116	-26		-0.59	
1134	EN116	-28		-1.83	
1140	IP309	-27		-1.21	
1146		-----		-----	
1194	EN116	-23.3		1.09	
1227	EN116	-22	C	1.90	First reported -18
1233	D6371	-27		-1.21	
1237	EN116	-27		-1.21	
1259	EN116	-26		-0.59	
1272	EN116	-28		-1.83	
1316	EN116	-28.0		-1.83	
1339		-----		-----	
1389		-----		-----	
1402	EN116	-21		2.52	
1459	EN116	-25.0		0.03	
1549	EN116	-26		-0.59	
1550	EN116	-27		-1.21	
1634	EN116	-27.0		-1.21	
1650	EN116	-21.0		2.52	
1706		-----		-----	
1724	IP309	-26		-0.59	
1728	D6371	-24		0.65	
1807	EN116	-27		-1.21	
1811	EN116	-25		0.03	
2146		-----		-----	
6168	D6371	-28		-1.83	
6201	EN116	-27		-1.21	
6308	D6371	-26		-0.59	
6359	EN116	-21		2.52	
6370	EN116	-25		0.03	
6371	EN116	-26		-0.59	
6373	EN116	-27		-1.21	

normality	suspect
n	49
outliers	0
mean (n)	-25.053
st.dev. (n)	2.3427
R(calc.)	6.560
st.dev.(EN116:15)	1.6083
R(EN116:15)	4.503



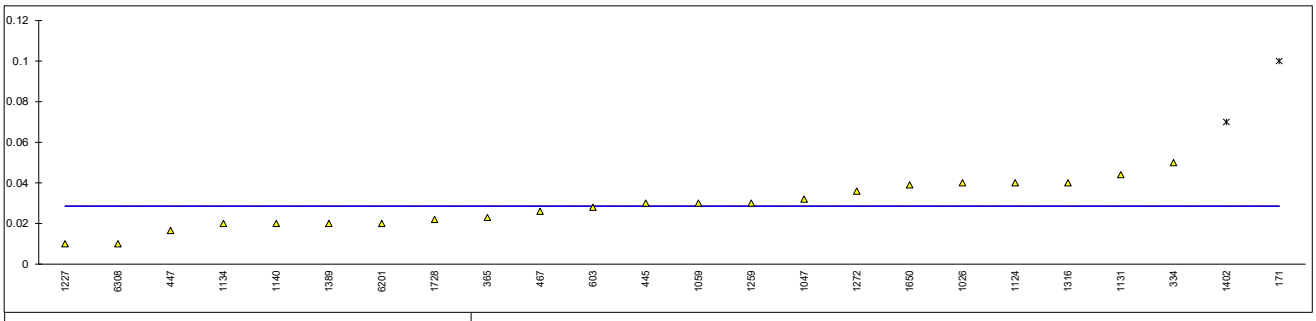


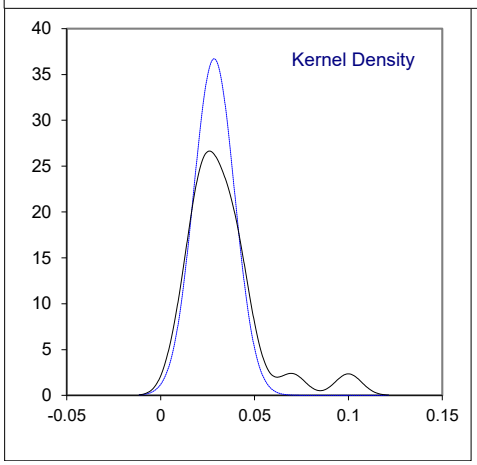
Determination of Carbon Residue (micro method) on 10% distillation residue on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62	D4530	<0.1		-----	
120	ISO10370	<0.01		-----	
140	D4530	<0.1		-----	
150		-----		-----	
171	D4530	0.1	R(0.01)	-----	
175		-----		-----	
230	ISO10370	<0.10	C	-----	First reported 0.08
237	D189	<0.1		-----	
238		-----		-----	
323	ISO10370	<0.10		-----	
328	ISO10370	<0.10		-----	
334	ISO10370	0.05		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
365	IP13	0.023		-----	
381		-----		-----	
445	ISO10370	0.03		-----	
447	IP398	0.0165		-----	
460		-----		-----	
467	ISO10370	0.026		-----	
496		-----		-----	
511		-----		-----	
529		-----		-----	
541	D4530	<0.1		-----	
603	D4530	0.028		-----	
621	D189	< 0.1		-----	
633		-----		-----	
663	D4530	<0.1		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026	ISO10370	0.04		-----	
1047	ISO10370	0.032		-----	
1059	ISO10370	0.03		-----	
1065		-----		-----	
1124	ISO10370	0.040		-----	
1126		-----		-----	
1131	ISO10370	0.044		-----	
1134	D4530	0.02		-----	
1140	IP398	0.02		-----	
1146		-----		-----	
1194		-----		-----	
1227	D4530	0.01		-----	
1233	ISO10370	<0.01		-----	
1237		-----		-----	
1259	ISO10370	0.03		-----	
1272	ISO10370	0.036		-----	
1316	ISO10370	0.04		-----	
1339		-----		-----	
1389	D4530	0.02	C	-----	First reported 0.071
1402	ISO10370	0.07	R(0.05)	-----	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	D189	0.039		-----	
1706		-----		-----	
1724	D4530	<0,1		-----	
1728	ISO10370	0.022		-----	
1807		-----		-----	
1811		-----		-----	
2146		-----		-----	
6168		-----		-----	
6201	ISO10370	0.02		-----	
6308	IP398	0.01		-----	
6359		-----		-----	
6370		-----		-----	
6371		-----		-----	
6373	ISO10370	<0.10		-----	

normality	OK
n	22
outliers	2
mean (n)	0.0285
st.dev. (n)	0.01087
R(calc.)	0.0304
st.dev.(ISO10370:14)	(0.00816)
R(ISO10370:14)	(0.0229)

application range 0.1-30%M/M





Determination of Ramsbottom Carbon Residue on 10% distillation residue on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D524	0.03		-----	
140	D524	0.06		-----	
150		-----		-----	
171	D524	0.09		-----	
175	D524	0.10		-----	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334		-----		-----	
335		-----		-----	
338		-----		-----	
343		-----		-----	
365		-----		-----	
381		-----		-----	
445	D524	0.05		-----	
447		-----		-----	
460		-----		-----	
467		-----		-----	
496		-----		-----	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026		-----		-----	
1047		-----		-----	
1059		-----		-----	
1065		-----		-----	
1124		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1140		-----		-----	
1146		-----		-----	
1194		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	D524	0.08		-----	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807		-----		-----	
1811		-----		-----	
2146		-----		-----	
6168		-----		-----	
6201		-----		-----	
6308		-----		-----	
6359		-----		-----	
6370		-----		-----	
6371		-----		-----	
6373		-----		-----	

normality	unknown
n	6
outliers	0
mean (n)	0.0683
st.dev. (n)	0.02639
R(calc.)	0.0739
st.dev.(D524:15)	(0.01092)
R(D524:15)	(0.0306)

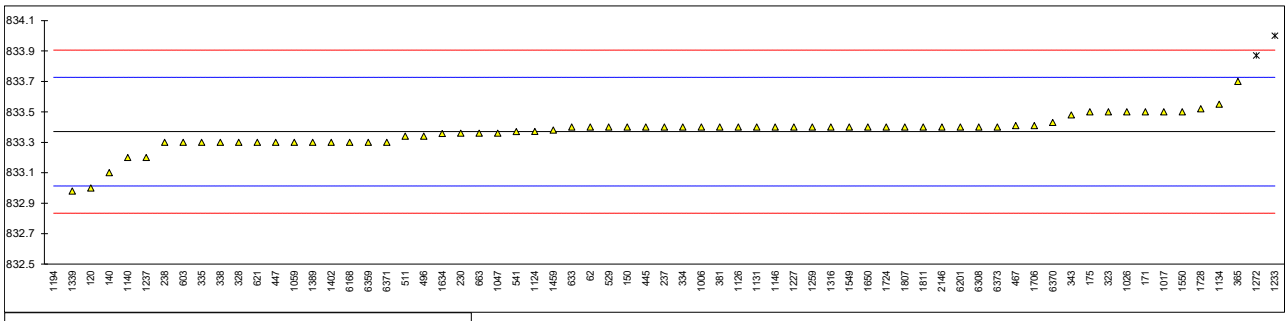
Determination of Copper Corrosion 3hrs at 50 °C on sample #21070: rating

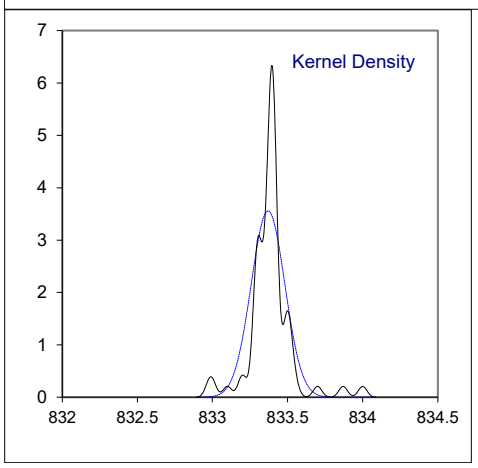
lab	method	value	mark	z(targ)	remarks
62	D130	1a		-----	
120	D130	1A		-----	
140	D130	1a		-----	
150		-----		-----	
171	D130	1a		-----	
175		-----		-----	
230	D130	1a		-----	
237	D130	1A		-----	
238	D130	1a		-----	
323	D130	1A		-----	
328	D130	1		-----	
334	D130	1a		-----	
335		-----		-----	
338		-----		-----	
343	ISO2160	1a		-----	
365	IP154	1a		-----	
381		-----		-----	
445	D130	1a		-----	
447	IP154	1a		-----	
460		-----		-----	
467	ISO2160	1A		-----	
496	ISO2160	1a		-----	
511	D130	1A		-----	
529	D130	1a		-----	
541	D130	1a		-----	
603	D130	1A		-----	
621	D130	1A		-----	
633	D130	1a		-----	
663	D130	1a		-----	
1006	D130	1a		-----	
1016		-----		-----	
1017	ISO2160	1a		-----	
1026	ISO2160	1A		-----	
1047	ISO2160	1		-----	
1059	ISO2160	1a		-----	
1065		-----		-----	
1124	ISO2160	1a		-----	
1126		-----		-----	
1131	ISO2160	1a		-----	
1134	IP154	1a		-----	
1140	IP154	1		-----	
1146		-----		-----	
1194		-----		-----	
1227	D130	1A		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1272	ISO2160	1a		-----	
1316	D130	1a		-----	
1339	ISO2160	1a		-----	
1389	D130	1A		-----	
1402	D130	1A		-----	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634	ISO2160	1a		-----	
1650	D130	1a		-----	
1706		-----		-----	
1724	D130	1a		-----	
1728	D130	1A		-----	
1807	D130	1a		-----	
1811		-----		-----	
2146		-----		-----	
6168	D130	1a		-----	
6201	D130	1A		-----	
6308	D130	1a		-----	
6359	D130	1		-----	
6370		-----		-----	
6371		-----		-----	
6373	ISO2160	1A		-----	
	n	48			
	mean (n)	1 (1A)			

Determination of Density at 15°C on sample #21070; result in kg/m^3

lab	method	value	mark	z(targ)	remarks
62	D4052	833.4		0.17	
120	ISO12185	833.0		-2.07	
140	D4052	833.1		-1.51	
150	D4052	833.4		0.17	
171	D4052	833.5		0.73	
175	D4052	833.5		0.73	
230	ISO12185	833.36		-0.06	
237	D4052	833.4		0.17	
238	D4052	833.3		-0.39	
323	ISO12185	833.5		0.73	
328	ISO12185	833.3		-0.39	
334	ISO12185	833.4		0.17	
335	ISO12185	833.3		-0.39	
338	ISO12185	833.3		-0.39	
343	ISO12185	833.48		0.61	
365	IP365	833.7		1.85	
381	ISO12185	833.4		0.17	
445	D4052	833.4		0.17	
447	IP365	833.3		-0.39	
460		-----		-----	
467	ISO12185	833.41		0.22	
496	ISO12185	833.34		-0.17	
511	D4052	833.34		-0.17	
529	D4052	833.4		0.17	
541	ISO12185	833.37		0.00	
603	D4052	833.3		-0.39	
621	D4052	833.3		-0.39	
633	D1298	833.4		0.17	
663	D4052	833.36		-0.06	
1006	D4052	833.4		0.17	
1016		-----		-----	
1017	D4052	833.5		0.73	
1026	D4052	833.5		0.73	
1047	ISO12185	833.36		-0.06	
1059	ISO12185	833.3		-0.39	
1065		-----		-----	
1124	ISO12185	833.371		0.00	
1126	ISO12185	833.4		0.17	
1131	ISO12185	833.4		0.17	
1134	ISO12185	833.55		1.01	
1140	IP365	833.2		-0.95	
1146	D4052	833.4		0.17	
1194	In house	806	C,R(0.01)	-153.27	First reported 80.6
1227	D4052	833.4		0.17	
1233	ISO12185	834.0	R(0.01)	3.53	
1237	ISO12185	833.2		-0.95	
1259	ISO12185	833.4		0.17	
1272	ISO12185	833.87	R(0.01)	2.80	
1316	D4052	833.4		0.17	
1339	ISO3675	832.98		-2.19	
1389	ISO12185	833.3	C	-0.39	First reported 0.8333 kg/m^3
1402	ISO12185	833.3		-0.39	
1459	ISO12185	833.38		0.05	
1549	ISO12185	833.4	C	0.17	First reported 829.4
1550	ISO12185	833.5	C	0.73	First reported 829.3
1634	ISO12185	833.358		-0.07	
1650	ISO12185	833.4		0.17	
1706	ISO12185	833.41		0.22	
1724	D1298	833.4		0.17	
1728	D4052	833.52		0.84	
1807	ISO12185	833.4		0.17	
1811	ISO12185	833.4		0.17	
2146	ISO12185	833.4		0.17	
6168	D4052	833.3		-0.39	
6201	D4052	833.4		0.17	
6308	IP365	833.4		0.17	
6359	D4052	833.3		-0.39	
6370	ISO12185	833.43		0.33	
6371	D7042	833.30		-0.39	
6373	ISO12185	833.4		0.17	

normality	not OK
n	64
outliers	3
mean (n)	833.370
st.dev. (n)	0.1121
R(calc.)	0.314
st.dev.(ISO12185:96)	0.1786
R(ISO12185:96)	0.5



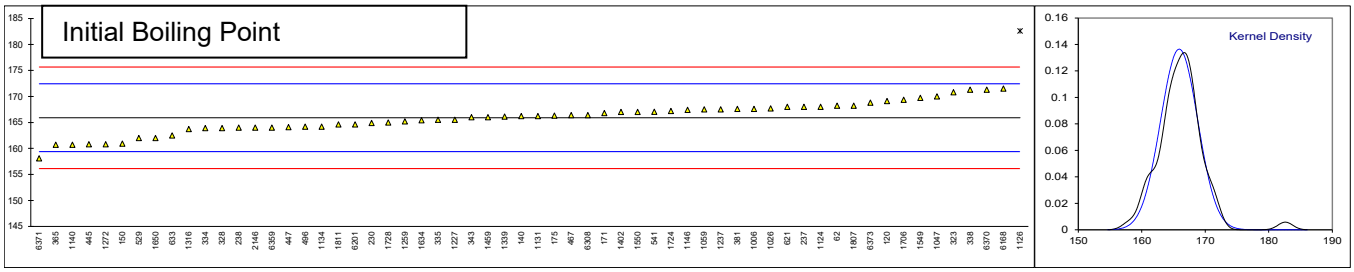


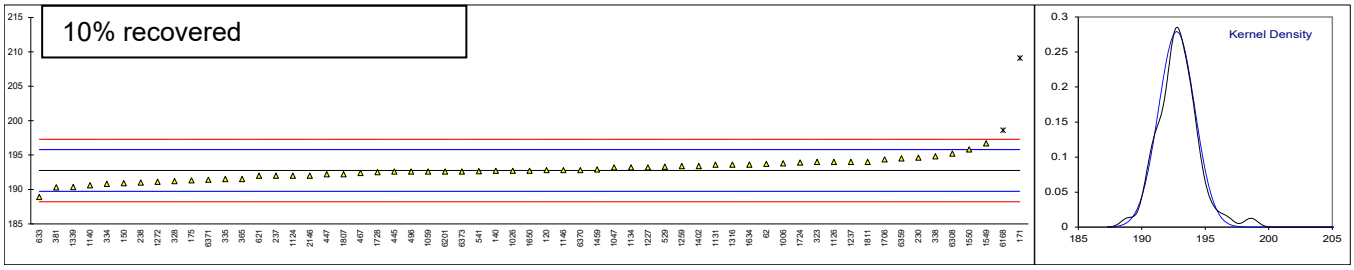
Determination of Distillation at 760 mmHg on sample #21070; result in °C

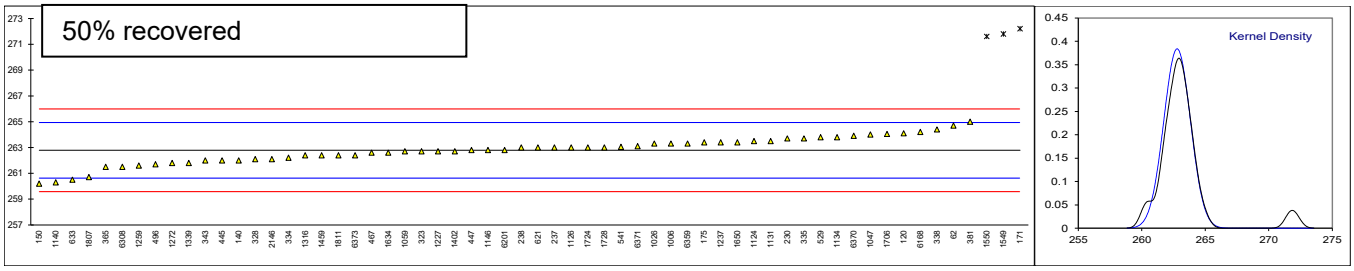
lab	method	IBP	mark	10%rec	mark	50%rec	mark	90%rec	mark	95%rec	mark	FBP	mark
62	D86-automated	168.2		193.7		264.7		336.9		352.2		358.8	
120	D86-automated	169.1		192.8		264.1		336.2		-----		357.4	
140	D86-automated	166.2		192.7		262.0		334.3		347.2		354.2	
150	D86-automated	160.9		190.9		260.2		332.3		343.7		350.3	
171	D86-automated	166.8		209.1	R(1)	272.2	R(1)	336.6		347.7		355.6	
175	D86-automated	166.3		191.3		263.4		337.5		352.2		356.8	
230	D86-automated	164.9		194.6		263.7		336.5		349.6		353.1	
237	D86-manual	168.0		192.0		263.0		332.0		342.0		355.0	
238	D86-manual	164.0		191.0		263.0		338.0		350.0		360.0	
323	ISO3405-automated	170.8		194.0		262.7		336.2		350.8		356.3	
328	ISO3405-automated	163.9		191.2		262.1		334.3		346.6		354.4	
334	ISO3405-automated	163.9		190.8		262.2		334.3		348.3		354.3	
335	ISO3405	165.5		191.5		263.7		337.4		352.6		357.1	
338	ISO3405-automated	171.3		194.8		264.4		335.8		349.0		358.1	
343	ISO3405-automated	166		-----		262		335.2		348.6		358.7	
365	IP123-automated	160.7		191.5		261.5		334.1		346.5		354.7	
381	ISO3405-automated	167.6		190.3	C	265.0		338.1		349.2		352.2	
445	ISO3405-automated	160.8		192.6		262.0		334.9		348.4		354.4	
447	IP123-automated	164.1		192.2		262.8		335.5		348.7		357.5	
460		-----		-----		-----		-----		-----		-----	
467	ISO3405-automated	166.4		192.4		262.6		333.7		347.3		354.2	
496	ISO3405-automated	164.2		192.6		261.7		334.2		346.9		356.0	
511		-----		-----		-----		-----		-----		-----	
529	D86	162.0		193.3		263.8		336.1		350.1		355.7	
541	ISO3405-automated	167.05		192.65		263.05		335.00		348.40		356.05	
603		-----		-----		-----		-----		-----		-----	
621	D86-manual	168.0		192.0		263.0		347.0	R(1)	353.0		355.0	
633	D86-automated	162.5		188.9		260.5		334.6		346.0		348.2	R(5)
663		-----		-----		-----		-----		-----		-----	
1006	D86-automated	167.6		193.8		263.3		334.0		345.8		355.5	
1016		-----		-----		-----		-----		-----		-----	
1017		-----		-----		-----		-----		-----		-----	
1026		167.7		192.7		263.3		335.7		349		355.8	
1047	ISO3405-automated	170.0		193.2		264.0		337.1		351.0		357.9	
1059	ISO3405-automated	167.5		192.6		262.7		335.0		348.4		356.9	
1065		-----		-----		-----		-----		-----		-----	
1124		168		192.0		263.5		335.0		346.0		356.5	
1126		182.6	R(1)	194.0		263.0		335.2		346.8		358.2	
1131	ISO3405-automated	166.2		193.6		263.5		336.2		350.3		354.9	
1134	D86-automated	164.2		193.2		263.8		335.8		349.3		356.3	
1140	IP123-automated	160.7		190.6		260.3		332.9		344.9		353.0	
1146	D86-automated	167.4		192.8		262.8		334.5		345.8		357.1	
1194		-----		-----		-----		-----		-----		-----	
1227	D86-automated	165.5		193.2		262.7		335.1		348.0		356.9	
1233		-----		-----		-----		-----		-----		-----	
1237	ISO3405-automated	167.5		194.0		263.4		334.7		347.3		356.1	
1259	ISO3405-automated	165.2		193.4		261.6		332.9		344.3		354.7	
1272		160.8		191.1		261.8		335.9		350.1		355.9	
1316	D86-automated	163.7		193.6		262.4		334.3		345.8		355.5	
1339	ISO3405-automated	166.10		190.35		261.80		333.95		346.80		355.40	
1389		-----		-----		-----		-----		-----		-----	
1402	ISO3405-automated	167.0		193.4		262.7		334.4		347.2		356.4	
1459	ISO3405-automated	166.0		192.9		262.4		333.5		346.1		354.9	
1549	ISO3405-automated	169.7		196.7		271.8	C,R(1)	339.1		353.2		360.2	
1550	ISO3405-automated	167.0		195.8		271.6	C,R(1)	338.7		352.8		360.7	
1634		165.4		193.6		262.6		334.5		347.3		357.5	
1650	D86-automated	162.0		192.7		263.4		335.4		348.1		355.8	
1706	ISO3405-automated	169.35		194.35		264.05		335.45		348.5		356.7	
1724	D86-automated	167.2		193.9		263.0		335.1		347.6		356.6	
1728	ISO3405-manual	165		192.5		263		335		349		355	
1807	ISO3405-automated	168.2		192.2		260.7		333.2		344.7		355.8	
1811	D86-automated	164.6		194.0		262.4		334.2		345.4		355.1	
2146	ISO3405-automated	164.0		192.0		262.1		334.7		349.1		356.0	
6168	D86-automated	171.5		198.6	R(1)	264.2		338.8		352.4		359.2	
6201	D86-automated	164.6		192.6		262.8		335.3		348.1		356.2	
6308	IP123-automated	166.4		195.2		261.5		334.4		347.5		355.2	
6359		164		194.5		263.3		334.9		347.4		357.1	
6370	ISO3405-automated	171.30		192.80		263.90		335.50		346.60		353.00	
6371	ISO3405-automated	158.10		191.4	C	263.1	C	337.63		349.16		360.63	
6373		168.8		192.6		262.4		334.8		347.5		356.4	

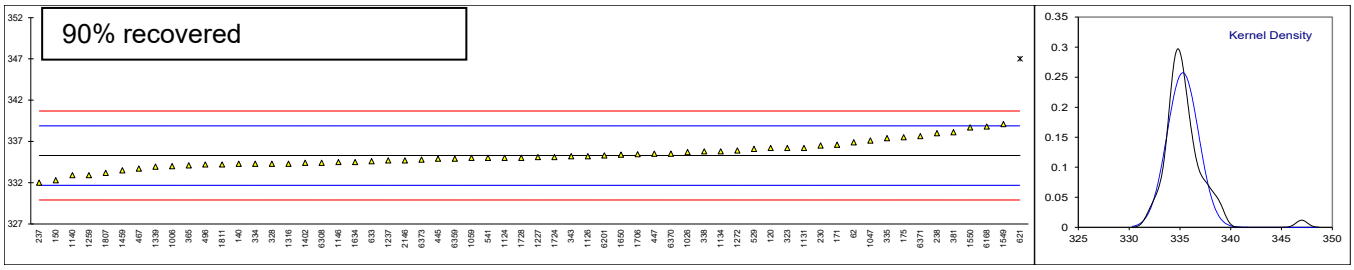
Lab 381: first reported 197.3
Lab 1549: first reported 267.5
Lab 1550: first reported 267.2
Lab 6371: first reported 188.10 and 259.70 respectively

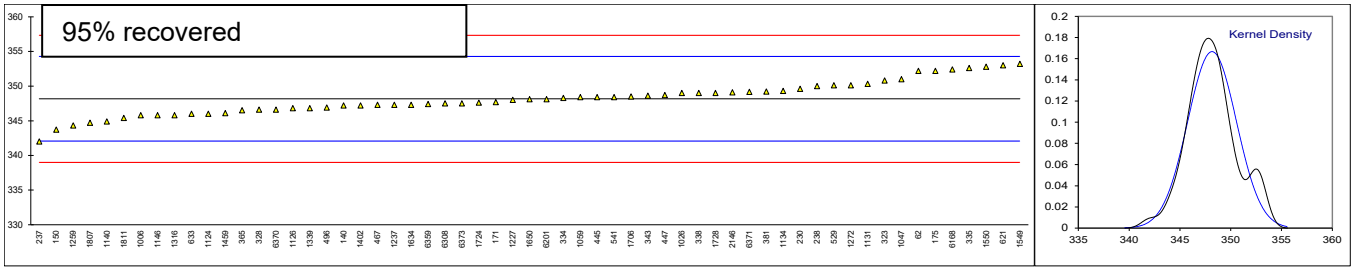
normality	OK	OK	OK	OK	OK	OK
n	59	57	57	59	59	59
outliers	1	2	3	1	0	1
mean (n)	165.89	192.76	262.78	335.30	348.17	356.12
st.dev. (n)	2.923	1.430	1.039	1.550	2.395	1.982
R(calc.)	8.19	4.00	2.91	4.34	6.71	5.55
st.dev.(ISO3405-A:19)	3.259	1.515	1.071	1.796	3.052	2.536
R(ISO3405-A:19)	9.12	4.24	3	5.03	8.55	7.1
Compare						
R(ISO3405-M:19)	5.30	4.38	4.17	4.32	4.57	3.77

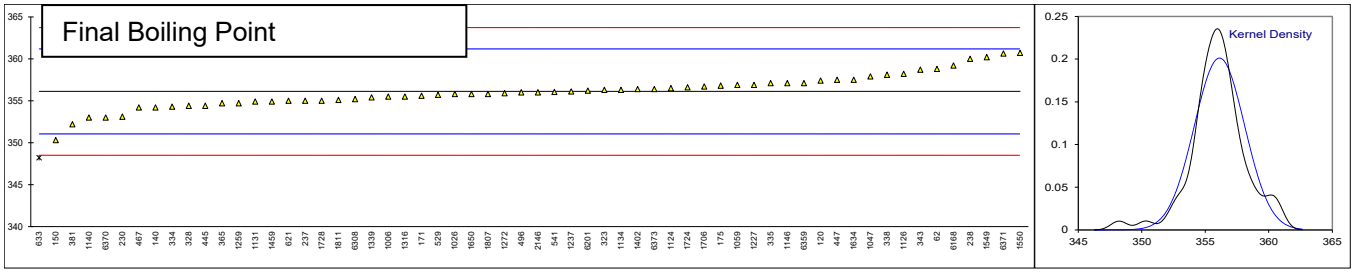








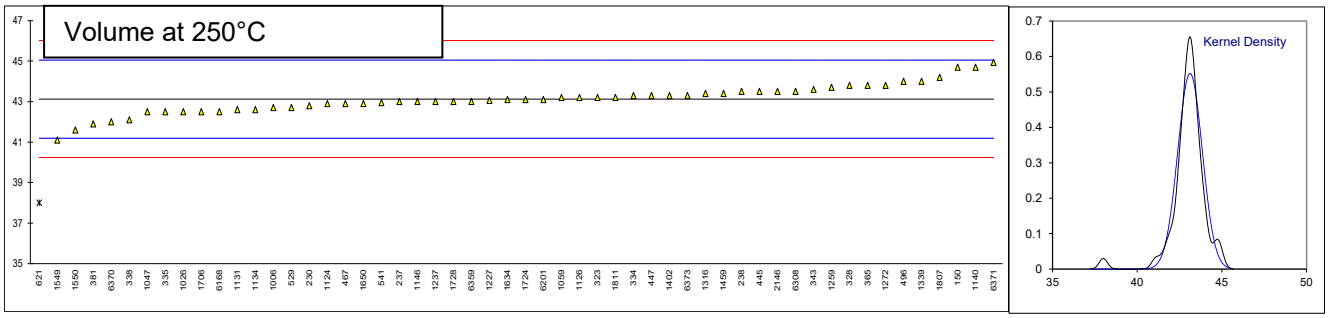


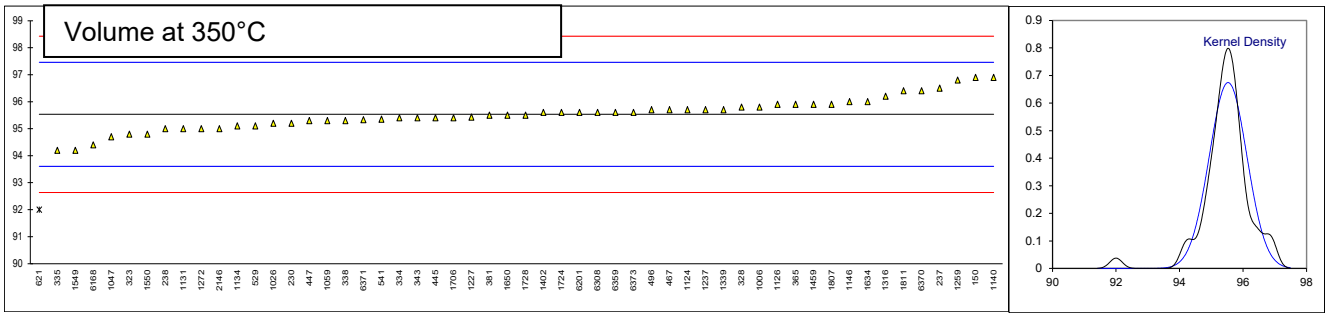


Determination of Distillation at 760 mmHg on sample #21070; result in %V/V

lab	method	Vol at 250°C	mark	z(targ)	Vol at 350°C	mark	z(targ)	% residue	remark
62		-----		-----	-----		-----	1.4	
120		-----		-----	-----		-----	1.1	
140		-----		-----	-----		-----	1.4	
150	D86-automated	44.7		1.63	96.9		1.42	1.8	
171		-----		-----	-----		-----	-----	
175		-----		-----	-----		-----	1.2	
230	D86-automated	42.8		-0.34	95.2		-0.34	1.4	
237	D86-manual	43.0		-0.13	96.5		1.00	1.0	
238	D86-manual	43.5		0.39	95.0		-0.55	1.5	
323	ISO3405-automated	43.2		0.08	94.8		-0.76	1.4	
328	ISO3405-automated	43.8		0.70	95.8		0.28	1.4	
334	ISO3405-automated	43.3		0.18	95.4		-0.14	1.4	
335	ISO3405	42.5		-0.65	94.2		-1.38	0.2	
338	ISO3405-automated	42.1		-1.06	95.3		-0.24	1.3	
343	ISO3405-automated	43.6		0.49	95.4		-0.14	1.5	
365	IP123-automated	43.8		0.70	95.9		0.38	1.8	
381	ISO3405-automated	41.9		-1.27	95.5		-0.03	-----	
445	ISO3405-automated	43.5		0.39	95.4		-0.14	1.9	
447	IP123-automated	43.3		0.18	95.3		-0.24	1.4	
460		-----		-----	-----		-----	-----	
467	ISO3405-automated	42.9		-0.23	95.7		0.17	1.7	
496	ISO3405-automated	44.0		0.91	95.7		0.17	1.5	
511		-----		-----	-----		-----	-----	
529	D86	42.7		-0.44	95.1		-0.45	2.0	
541	ISO3405-automated	42.95		-0.18	95.35		-0.19	1.4	
603		-----		-----	-----		-----	-----	
621	D86-manual	38.0	R(0.01)	-5.32	92.0	R(0.01)	-3.66	1	
633		-----		-----	-----		-----	1.9	
663		-----		-----	-----		-----	-----	
1006	D86-automated	42.7		-0.44	95.8	C	0.28	1.4	f.r. 98.5
1016		-----		-----	-----		-----	-----	
1017		-----		-----	-----		-----	-----	
1026		42.5		-0.65	95.2		-0.34	1.9	
1047	ISO3405-automated	42.5		-0.65	94.7		-0.86	1.6	
1059	ISO3405-automated	43.2		0.08	95.3		-0.24	1.4	
1065		-----		-----	-----		-----	-----	
1124		42.9		-0.23	95.7		0.17	1.8	
1126		43.2		0.08	95.9		0.38	1.3	
1131	ISO3405-automated	42.6		-0.54	95.0		-0.55	-----	
1134	D86-automated	42.6		-0.54	95.1		-0.45	1.4	
1140	IP123-automated	44.7		1.63	96.9		1.42	1.4	
1146	D86-automated	43		-0.13	96		0.49	0.6	
1194		-----		-----	-----		-----	-----	
1227	D86-automated	43.06		-0.07	95.43		-0.11	0.86	
1233		-----		-----	-----		-----	-----	
1237	ISO3405-automated	43.0		-0.13	95.7		0.17	1.4	
1259	ISO3405-automated	43.7		0.60	96.8		1.31	1.3	
1272		43.8		0.70	95.0		-0.55	1.4	
1316	D86-automated	43.4		0.28	96.2		0.69	1.5	
1339	ISO3405-automated	44.00		0.91	95.70		0.17	1.70	
1389		-----		-----	-----		-----	-----	
1402	ISO3405-automated	43.3		0.18	95.6		0.07	1.2	
1459	ISO3405-automated	43.4		0.28	95.9		0.38	1.4	
1549	ISO3405-automated	41.1		-2.10	94.2		-1.38	1.1	
1550	ISO3405-automated	41.6		-1.58	94.8		-0.76	-----	
1634		43.1		-0.03	96.0		0.49	1.1	
1650	D86-automated	42.9		-0.23	95.5		-0.03	1.6	
1706	ISO3405-automated	42.5		-0.65	95.4		-0.14	1.5	
1724	D86-automated	43.1		-0.03	95.6		0.07	1.4	
1728	ISO3405-manual	43		-0.13	95.5		-0.03	1.4	
1807	ISO3405-automated	44.2		1.11	95.9		0.38	1.0	
1811	D86-automated	43.2		0.08	96.4		0.90	1.1	
2146	ISO3405-automated	43.5		0.39	95.0		-0.55	1.4	
6168	D86-automated	42.5		-0.65	94.4		-1.17	1.4	
6201	D86-automated	43.1		-0.03	95.6		0.07	1.4	
6308	IP123-automated	43.5		0.39	95.6		0.07	1.5	
6359		43.0		-0.13	95.6		0.07	1.0	
6370	ISO3405-automated	42.0		-1.17	96.4		0.90	1.80	
6371	ISO3405-automated	44.93		1.87	95.33		-0.21	1.9	
6373		43.3		0.18	95.6		0.07	1.4	

normality	suspect	OK
n	53	53
outliers	1	1
mean (n)	43.13	95.53
st.dev. (n)	0.723	0.591
R(calc.)	2.02	1.66
st.dev.(ISO3405-A:19)	0.964	0.964
R(ISO3405-A:19)	2.7	2.7
Compare		
R(ISO3405-M:19)	4.95	5.21

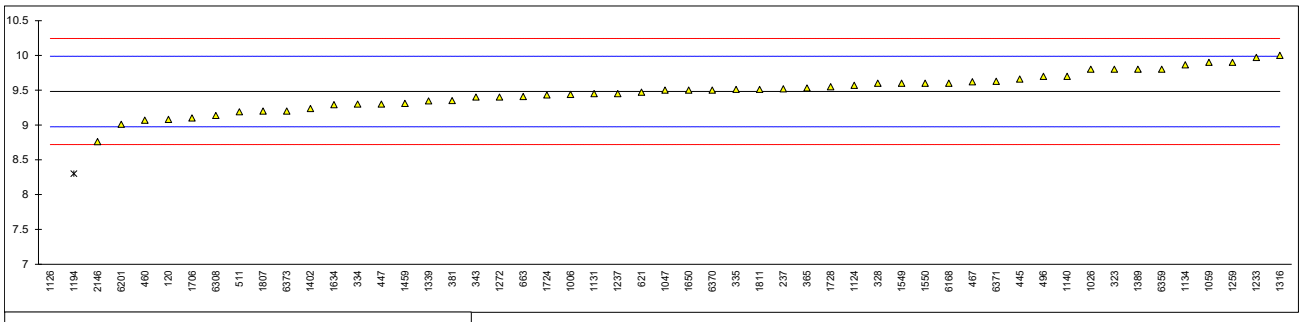


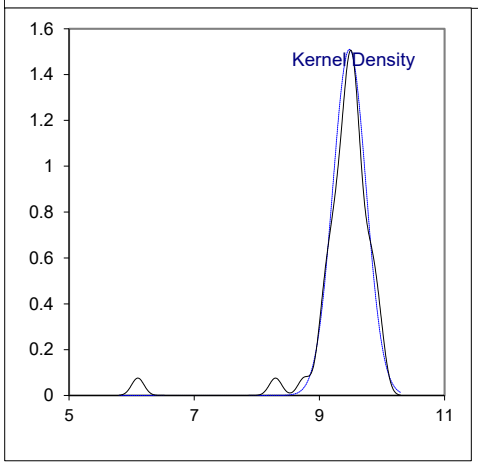


Determination of Fatty Acid Methyl Esters (FAME) on sample #21070; result in %V/V

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	D7371	9.08		-1.58	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
230		-----		-----	
237	D7371	9.52		0.15	
238		-----		-----	
323	EN14078-B	9.8		1.25	
328	EN14078-B	9.6		0.47	
334	EN14078-B	9.3		-0.72	
335	EN14078-B	9.51		0.11	
338		-----		-----	
343	EN14078-A	9.4		-0.32	
365	EN14078-B	9.533		0.20	
381	EN14078-B	9.35		-0.52	
445	EN14078-B	9.66		0.70	
447	EN14078-B	9.3		-0.72	
460	EN14078-B	9.068		-1.63	
467	EN14078-B	9.62		0.55	
496	EN14078-B	9.70		0.86	
511	D7371	9.190		-1.15	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621	EN14078-B	9.47		-0.05	
633		-----		-----	
663	EN14078-B	9.41		-0.28	
1006	EN14078-A	9.44		-0.16	
1016		-----		-----	
1017		-----		-----	
1026	EN14078-B	9.8		1.25	
1047	EN14078-B	9.5		0.07	
1059	EN14078-B	9.9		1.65	
1065		-----		-----	
1124	EN14078-B	9.57		0.35	
1126		6.1	R(0.01)	-13.32	
1131	EN14078-B	9.45	C	-0.12	First reported 10.42
1134	EN14078-B	9.865		1.51	
1140	EN14078-B	9.7		0.86	
1146		-----		-----	
1194	In house	8.3	R(0.01)	-4.66	
1227		-----		-----	
1233	EN14078	9.97		1.92	
1237	EN14078-B	9.45		-0.12	
1259	EN14078-A	9.9		1.65	
1272	EN14078-A	9.4		-0.32	
1316	EN14078-B	10.0		2.04	
1339	EN14078-A	9.346		-0.53	
1389	EN14078-B	9.8		1.25	
1402	EN14078-B	9.236		-0.97	
1459	EN14078-B	9.31		-0.68	
1549	D7861	9.6		0.47	
1550	D7861	9.6		0.47	
1634	EN14078-B	9.29		-0.76	
1650	EN14078-B	9.5		0.07	
1706	EN14078-B	9.1		-1.50	
1724	EN14078-A	9.43		-0.20	
1728	EN14078-B	9.55		0.27	
1807	EN14078-B	9.2		-1.11	
1811	EN14078-A	9.51		0.11	
2146	In house	8.76		-2.84	
6168	EN14078-B	9.6		0.47	
6201	EN14078-A	9.01		-1.86	
6308	EN14078-C	9.137		-1.36	
6359	EN14078-B	9.8		1.25	
6370	EN14078-B	9.5		0.07	
6371	EN14078-B	9.6275		0.57	
6373	EN14078-B	9.2		-1.11	

normality	OK
n	51
outliers	2
mean (n)	9.482
st.dev. (n)	0.2642
R(calc.)	0.740
st.dev.(EN14078-B:14)	0.2538
R(EN14078-B:14)	0.711
Compare	
R(D7371:14)	1.163

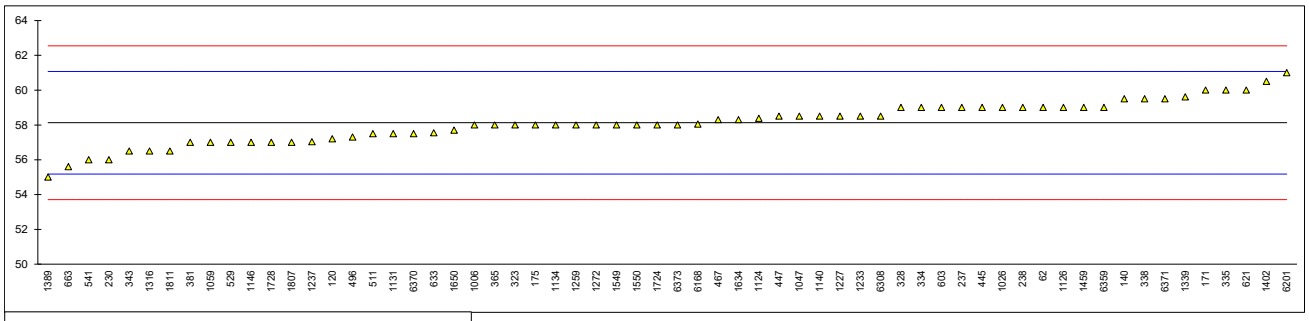


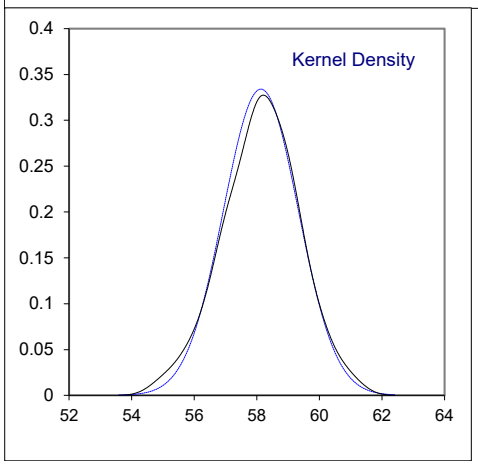


Determination of Flash Point PMcc on sample #21070; result in °C

lab	method	value	mark	z(targ)	remarks
62	D93-A	59.0		0.59	
120	ISO2719-A	57.2		-0.63	
140	D93-A	59.5		0.93	
150		-----		-----	
171	ISO2719-A	60.0		1.27	
175	D93-A	58		-0.09	
230	D93-A	56.0		-1.44	
237	D93-A	59.0		0.59	
238	D93	59.0		0.59	
323	ISO2719-A	58.0		-0.09	
328	ISO2719-A	59.0		0.59	
334	D93-A	59.0		0.59	
335	ISO2719-A	60.0		1.27	
338	ISO2719-A	59.5		0.93	
343	ISO2719-A	56.5		-1.11	
365	IP34-A	58.0		-0.09	
381	ISO2719-A	57.0		-0.77	
445	IP34-A	59.0		0.59	
447	IP34-B	58.5		0.25	
460		-----		-----	
467	ISO2719-A	58.3		0.12	
496	ISO2719-A	57.3		-0.56	
511	D93-A	57.5		-0.43	
529	D93	57.0		-0.77	
541	ISO2719-A	56.0		-1.44	
603	D93-A	59		0.59	
621	D93-C	60.0		1.27	
633	D93-A	57.55		-0.39	
663	D93-A	55.60		-1.72	
1006	D93-A	58.0		-0.09	
1016		-----		-----	
1017		-----		-----	
1026		59.0		0.59	
1047	ISO2719-A	58.5		0.25	
1059	ISO2719-A	57.0		-0.77	
1065		-----		-----	
1124	ISO3679	58.38		0.17	
1126		59		0.59	
1131	ISO2719-A	57.5		-0.43	
1134	D93-A	58.0		-0.09	
1140	IP34-A	58.5		0.25	
1146	D93-A	57.0		-0.77	
1194		-----		-----	
1227	D93-A	58.5		0.25	
1233	ISO2719-A	58.5		0.25	
1237	ISO2719-A	57.03		-0.75	
1259	ISO2719-A	58		-0.09	
1272	ISO2719-A	58.0		-0.09	
1316	D93-A	56.5		-1.11	
1339	ISO2719-A	59.61		1.00	
1389	D93-C	55.0		-2.12	
1402	ISO2719-B	60.5		1.61	
1459	ISO2719-A	59.0		0.59	
1549	ISO2719-A	58.0		-0.09	
1550	ISO2719-A	58.0		-0.09	
1634	ISO2719-A	58.3		0.12	
1650	ISO2719-A	57.7		-0.29	
1706		-----		-----	
1724	D93-A	58		-0.09	
1728	D93-A	57		-0.77	
1807	D93-A	57.0		-0.77	
1811	ISO2719-A	56.5		-1.11	
2146		-----		-----	
6168	D93-A	58.05		-0.05	
6201	ISO2719-A	61.0		1.95	
6308	D93-B	58.5		0.25	
6359	D93-A	59.0		0.59	
6370	ISO2719-A	57.5		-0.43	
6371	ISO2719-A	59.5		0.93	
6373	ISO2719-A	58.0		-0.09	

normality	OK
n	62
outliers	0
mean (n)	58.129
st.dev. (n)	1.1943
R(calc.)	3.344
st.dev.(ISO2719-A:16)	1.4740
R(ISO2719-A:16)	4.127

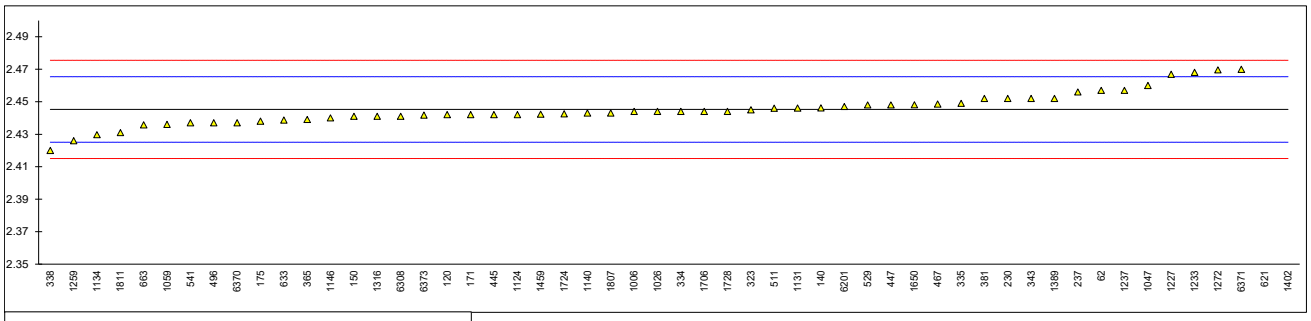


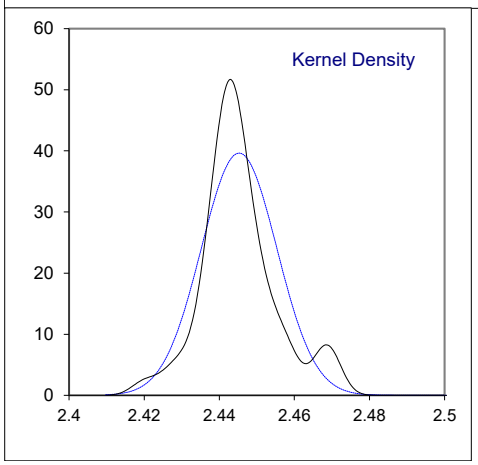


Determination of Kinematic Viscosity at 40°C on sample #21070; result in mm^2/s

lab	method	value	mark	z(targ)	remarks
62	D445	2.457		1.16	
120	ISO3104	2.442		-0.32	
140	D445	2.4462		0.09	
150	D445	2.441		-0.42	
171	ISO3104	2.442		-0.32	
175	D445	2.438		-0.72	
230	D445	2.452		0.67	
237	D445	2.456	C	1.07	First reported 2.496
238		-----		-----	
323	ISO3104	2.445		-0.02	
328		-----		-----	
334	ISO3104	2.444		-0.12	
335	D445	2.449		0.37	
338	ISO3104	2.41995		-2.51	
343	ISO3104	2.452		0.67	
365	IP71	2.439		-0.62	
381	D445	2.452		0.67	
445	D445	2.442		-0.32	
447	D445	2.448		0.27	
460		-----		-----	
467	ISO3104	2.4485		0.32	
496	ISO3104	2.437		-0.82	
511	D445	2.446		0.07	
529	D445	2.448		0.27	
541	ISO3104	2.4370		-0.82	
603		-----		-----	
621	D445	2.5581	R(0.01)	11.18	
633	D445	2.4387		-0.65	
663	D445	2.4358		-0.94	
1006	D445	2.444		-0.12	
1016		-----		-----	
1017		-----		-----	
1026	ISO3104	2.444		-0.12	
1047	ISO3104	2.460		1.46	
1059	ISO3104	2.436		-0.92	
1065		-----		-----	
1124	ISO3104	2.4420		-0.32	
1126		-----		-----	
1131	ISO3104	2.4461		0.08	
1134	IP71	2.4297		-1.54	
1140	IP71	2.443		-0.22	
1146	D445	2.440		-0.52	
1194		-----		-----	
1227	D445	2.4669		2.15	
1233	ISO3104-B	2.468		2.25	
1237	ISO3104	2.457		1.16	
1259	ISO3104	2.426		-1.91	
1272	ISO3104	2.4696		2.41	
1316	ISO3104	2.441		-0.42	
1339		-----	W	-----	Test result withdrawn, reported 2.3471
1389	D445	2.452		0.67	
1402	ISO3104	2.622	R(0.01)	17.52	
1459	D7042	2.4423		-0.29	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	ISO3104	2.4481		0.28	
1706	ISO3104	2.444		-0.12	
1724	D445	2.4426		-0.26	
1728	D445	2.444		-0.12	
1807	ISO3104	2.443		-0.22	
1811	ISO3104	2.431		-1.41	
2146		-----		-----	
6168		-----		-----	
6201	ISO3104	2.447		0.17	
6308	D445	2.441		-0.42	
6359		-----	W	-----	Test result withdrawn, reported 2.507
6370	D7042	2.4370		-0.82	
6371	D7042	2.4699		2.44	
6373	ISO3104	2.4417		-0.35	

normality	suspect
n	52
outliers	2
mean (n)	2.44525
st.dev. (n)	0.010069
R(calc.)	0.02819
st.dev.(ISO3104:20)	0.010090
R(ISO3104:20)	0.02825

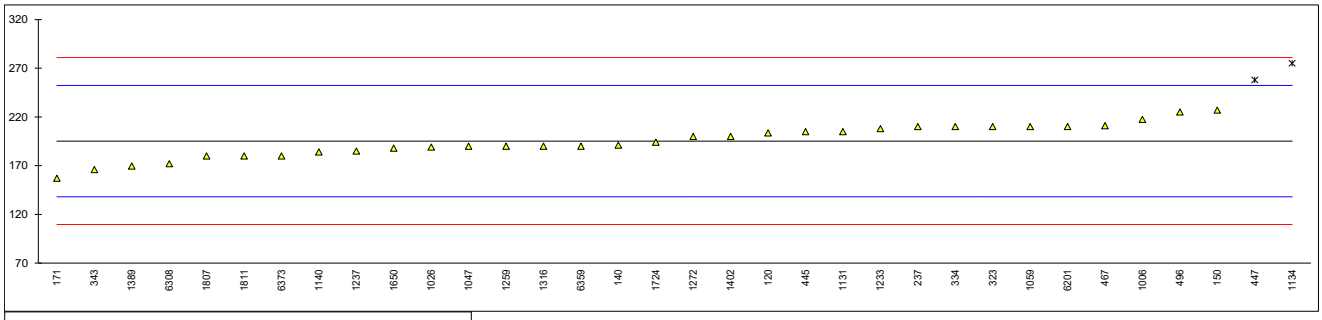


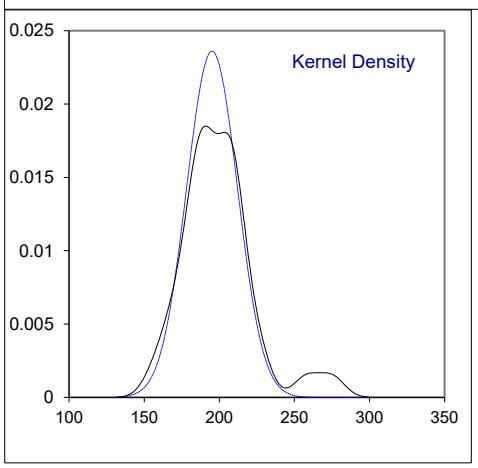


Determination of Lubricity by HFRR at 60°C on sample #21070; result in µm

lab	method	value	mark	z(targ)	corrected	remarks
62		-----		-----		
120	ISO12156-1-A	203.5		0.29	No	
140	D6079	191		-0.15		
150	D6079	227		1.11		
171	ISO12156-1-A	157		-1.34		
175		-----		-----		
230		-----		-----		
237	D6079	210		0.52	No	
238		-----		-----		
323	ISO12056-2	210	C	0.52		First reported 310
328		-----		-----		
334	ISO12156-1-B	210		0.52	No	
335		-----		-----		
338		-----		-----		
343	ISO12156-1 (2006)	166		-1.02		
365		-----		-----		
381		-----		-----		
445	ISO12156-1-A	205		0.34	No	
447	ISO12156-1-B	258	R(0.05)	2.20	No	
460		-----		-----		
467	ISO12156-1 (2006)	211		0.55	Yes	
496	ISO12156-1-A	225		1.04		
511		-----		-----		
529		-----		-----		
541		-----		-----		
603		-----		-----		
621		-----		-----		
633		-----		-----		
663		-----		-----		
1006	D6079	217.5		0.78		
1016		-----		-----		
1017		-----		-----		
1026	ISO12156-1 (2006)	189		-0.22		
1047	ISO12156-1 (2006)	190		-0.18		
1059	ISO12156-1-A	210		0.52	No	
1065		-----		-----		
1124		-----		-----		
1126		-----		-----		
1131	ISO12156-1-A	205		0.34	No	
1134	ISO12156-1 (2006)	275	R(0.05)	2.79	Yes	
1140	IP450	184		-0.39	Yes	
1146		-----		-----		
1194		-----		-----		
1227		-----		-----		
1233	ISO12156-1-A	208		0.45	No	
1237	ISO12156-1-A	185		-0.36	No	
1259	ISO12156-1-B	190		-0.18	No	
1272	ISO12156-1-A	200		0.17		
1316	ISO12156-1-B	190		-0.18	Yes	
1339		-----		-----		
1389	ISO12156-1-A	169.5		-0.90	No	
1402	ISO12156-1-B	200		0.17	No	
1459		-----		-----		
1549		-----		-----		
1550		-----		-----		
1634		-----		-----		
1650	ISO12156-1-B	188		-0.25	No	
1706		-----		-----		
1724	IP450	194		-0.04	No	
1728		-----		-----		
1807	ISO12156-1-B	180		-0.53		
1811	ISO12156-1-A	180.0		-0.53		
2146		-----		-----		
6168		-----		-----		
6201	ISO12156-1-A	210		0.52	Yes	
6308	IP450	172		-0.81	No	
6359	ISO12156-1-B	190		-0.18		
6370		-----		-----		
6371		-----		-----		
6373	ISO12156-1-A	180		-0.53	Yes	

normality	OK	
n	32	
outliers	2	
mean (n)	195.23	
st.dev. (n)	16.909	
R(calc.)	47.34	
st.dev.(ISO12156-1-A:18)	28.571	
R(ISO12156-1-A:18)	80	Method A = Digital Camera
compare		
R(ISO12156-1-B:18)	90	Method B= Visual

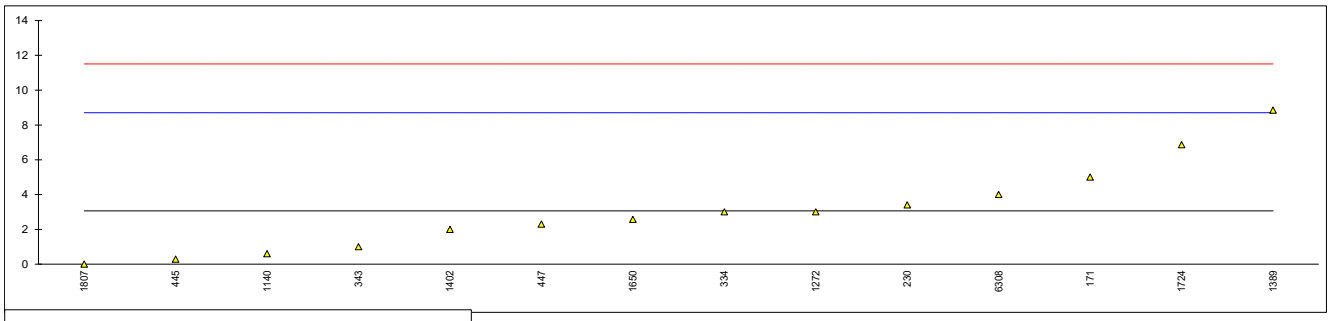


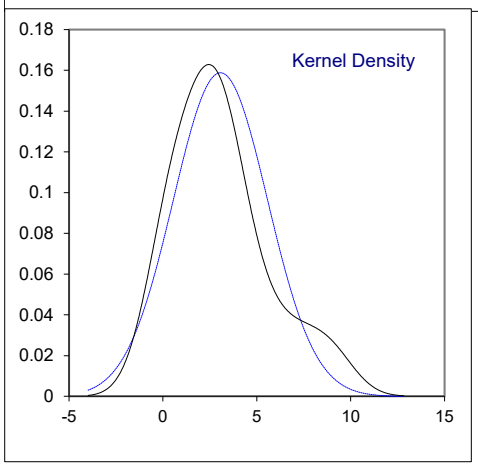


Determination of Oxidation Stability on sample #21070; result in g/m^3

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	ISO12205	<1		-----	
140		-----		-----	
150		-----		-----	
171	ISO12205	5		0.69	
175		-----		-----	
230	ISO12205	3.4		0.12	
237	D2274	<1		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334	ISO12205	3		-0.02	
335		-----		-----	
338		-----		-----	
343	ISO12205	1		-0.73	
365		-----		-----	
381		-----		-----	
445	ISO12205	0.29		-0.98	
447	ISO12205	2.3		-0.27	
460		-----		-----	
467		-----		-----	
496		-----		-----	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026		-----		-----	
1047		-----		-----	
1059		-----		-----	
1065		-----		-----	
1124		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1140	IP388	0.60		-0.87	
1146		-----		-----	
1194		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1272	ISO12205	3		-0.02	
1316	ISO12205	<1		-----	
1339		-----		-----	
1389	D2274	8.85		2.06	
1402	ISO12205	2		-0.38	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	ISO12205	2.572		-0.17	
1706		-----		-----	
1724	D2274	6.86		1.35	
1728		-----		-----	
1807	ISO12205	0		-1.09	
1811		-----		-----	
2146		-----		-----	
6168		-----		-----	
6201	ISO12205	<1		-----	
6308	D2274	4		0.33	
6359		-----		-----	
6370		-----		-----	
6371		-----		-----	
6373		-----		-----	

normality	suspect
n	14
outliers	0
mean (n)	3.062
st.dev. (n)	2.5116
R(calc.)	7.032
st.dev.(ISO12205:95)	2.8162
R(ISO12205:95)	7.885

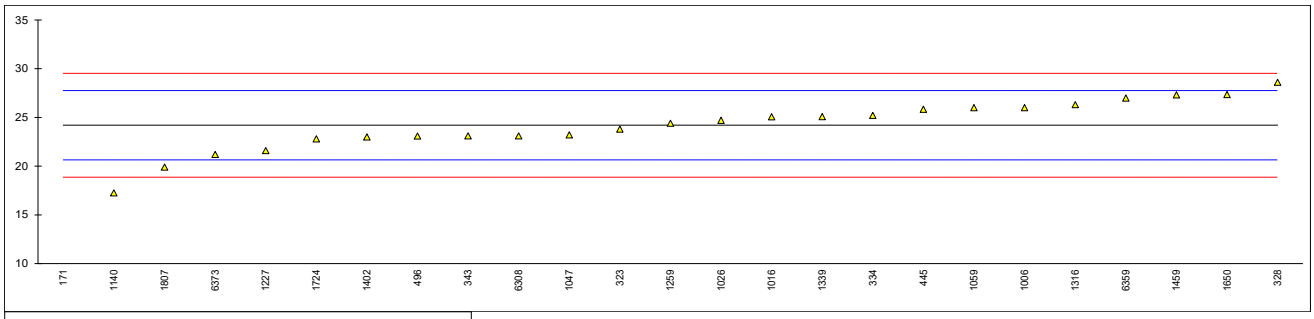


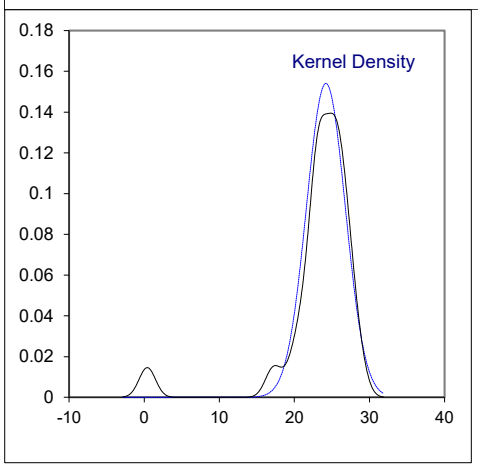


Determination of Oxidation Stability induction period on sample #21070; result in hours

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	EN15751	0.4	R(0.01)	-13.38	
175		-----		-----	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323	EN15751	23.8		-0.23	
328	EN15751	28.6		2.47	
334	EN15751	25.2		0.56	
335		-----		-----	
338		-----		-----	
343	EN15751	23.1		-0.62	
365		-----		-----	
381		-----		-----	
445	EN15751	25.84		0.92	
447	EN15751	>20		-----	
460		-----		-----	
467		-----		-----	
496	EN15751	23.09		-0.63	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006	EN15751	26		1.01	
1016	EN15751	25.07		0.49	
1017		-----		-----	
1026	EN15751	24.7		0.28	
1047	EN15751	23.21		-0.56	
1059	EN15751	26.0		1.01	
1065		-----		-----	
1124		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1140	EN15751	17.25		-3.91	
1146		-----		-----	
1194		-----		-----	
1227	EN15751	21.59		-1.47	
1233		-----		-----	
1237		-----		-----	
1259	EN15751	24.4		0.11	
1272		-----		-----	
1316	EN15751	26.3		1.18	
1339	EN15751	25.08		0.49	
1389		-----		-----	
1402	EN15751	23.00		-0.68	
1459	EN15751	27.32		1.75	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	EN15751	27.35	C	1.77	First reported 32.92
1706		-----		-----	
1724	EN15751	22.79		-0.79	
1728		-----		-----	
1807	EN15751	19.90		-2.42	
1811		-----		-----	
2146		-----		-----	
6168		-----		-----	
6201		-----		-----	
6308	EN15751	23.1		-0.62	
6359	EN15751	26.99		1.57	
6370		-----		-----	
6371		-----		-----	
6373	EN15751	21.2		-1.69	

normality	OK
n	24
outliers	1
mean (n)	24.203
st.dev. (n)	2.5878
R(calc.)	7.246
st.dev.(EN15751:14)	1.7788
R(EN15751:14)	4.981



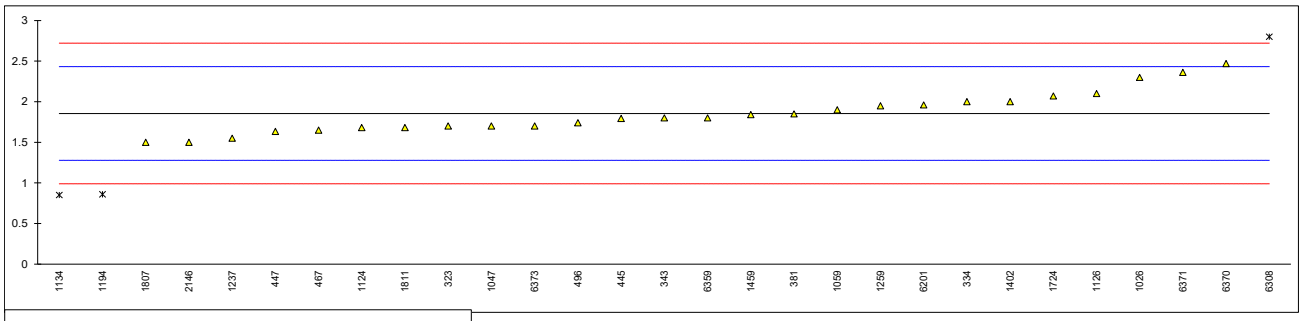


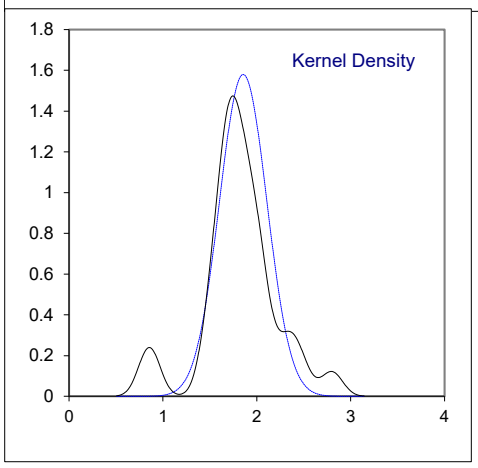
Determination of Polycyclic Aromatic Hydrocarbons *) on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323	EN12916	1.7		-0.54	
328		-----		-----	
334	EN12916	2.0		0.50	
335		-----		-----	
338		-----		-----	
343	EN12916	1.8		-0.19	
365		-----		-----	
381	EN12916	1.85		-0.02	
445	IP391	1.794		-0.21	
447	IP391	1.6343		-0.76	
460		-----		-----	
467	EN12916	1.65		-0.71	
496	EN12916	1.74		-0.40	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026	EN12916	2.3		1.54	
1047	EN12916	1.7		-0.54	
1059	EN12916	1.9		0.16	
1065		-----		-----	
1124	EN12916	1.68		-0.61	
1126		2.1		0.85	
1131		-----		-----	
1134	IP391	0.85	R(0.05)	-3.48	
1140		-----		-----	
1146		-----		-----	
1194	EN12916	0.86	R(0.05)	-3.45	
1227		-----		-----	
1233		-----		-----	
1237	EN12916	1.55		-1.06	
1259	EN12916	1.95		0.33	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	EN12916	2.0		0.50	
1459	EN12916	1.84		-0.05	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724	IP391	2.07		0.75	
1728		-----		-----	
1807	EN12916	1.5		-1.23	
1811		1.68		-0.61	
2146	EN12916	1.5		-1.23	
6168		-----		-----	
6201	EN12916	1.96		0.36	
6308	IP391	2.80	R(0.05)	3.27	
6359	EN12916	1.8		-0.19	
6370	In house	2.47	C	2.13	First reported 2.8
6371	In house	2.36		1.75	
6373	EN12916	1.7		-0.54	

*) %Polycyclic Aromatic Hydrocarbons = sum of the di-aromatic hydrocarbons and tri+-aromatic hydrocarbons

normality	OK
n	26
outliers	3
mean (n)	1.855
st.dev. (n)	0.2525
R(calc.)	0.707
st.dev.(EN12916:19)	0.2886
R(EN12916:19)	0.808

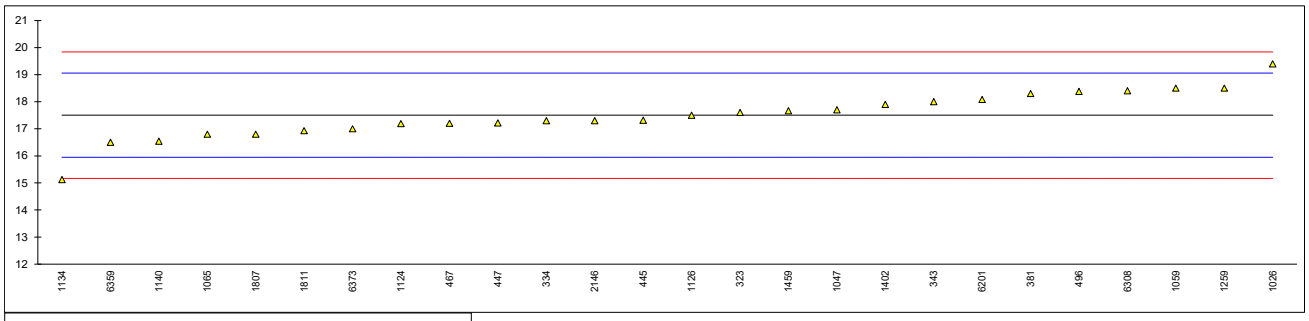


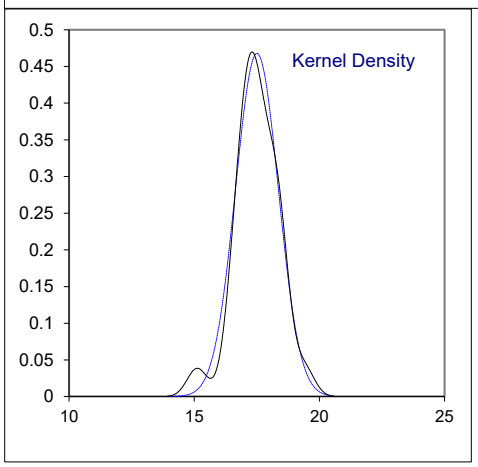


Determination of Mono-Aromatic Hydrocarbons on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323	EN12916	17.6		0.12	
328		-----		-----	
334	EN12916	17.3		-0.26	
335		-----		-----	
338		-----		-----	
343	EN12916	18		0.64	
365		-----		-----	
381	EN12916	18.3		1.02	
445	IP391	17.316		-0.24	
447	IP391	17.2152		-0.37	
460		-----		-----	
467	EN12916	17.20		-0.39	
496	EN12916	18.38		1.13	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026	EN12916	19.4		2.44	
1047	EN12916	17.7		0.25	
1059	EN12916	18.5		1.28	
1065		16.8		-0.91	
1124	EN12916	17.19		-0.41	
1126		17.5		-0.01	
1131		-----		-----	
1134	IP391	15.12		-3.07	
1140	IP391	16.54		-1.24	
1146		-----		-----	
1194		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	18.50		1.28	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	EN12916	17.9		0.51	
1459	EN12916	17.66		0.20	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	16.8		-0.91	
1811		16.93		-0.74	
2146	EN12916	17.3		-0.26	
6168		-----		-----	
6201	EN12916	18.08		0.74	
6308	IP391	18.40		1.15	
6359	EN12916	16.5		-1.29	
6370		-----		-----	
6371		-----		-----	
6373	EN12916	17.0		-0.65	

normality	suspect
n	26
outliers	0
mean (n)	17.5050
st.dev. (n)	0.85271
R(calc.)	2.3876
st.dev.(EN12916:19)	0.77740
R(EN12916:19)	2.1767

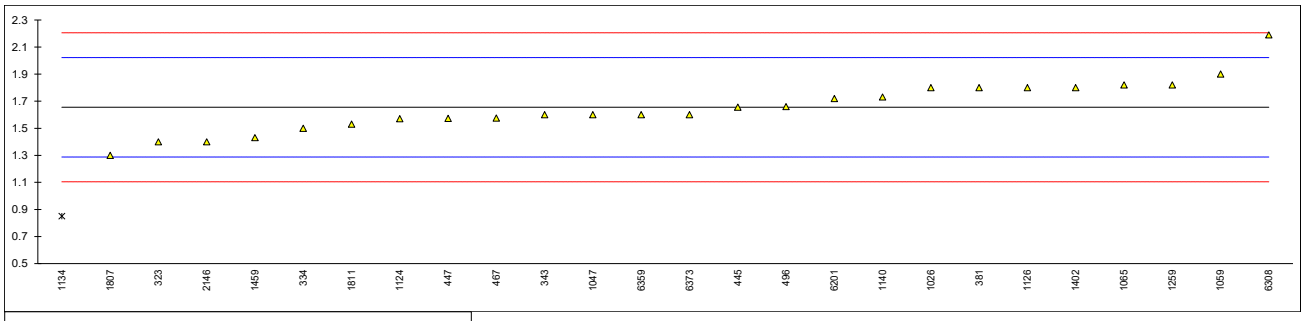


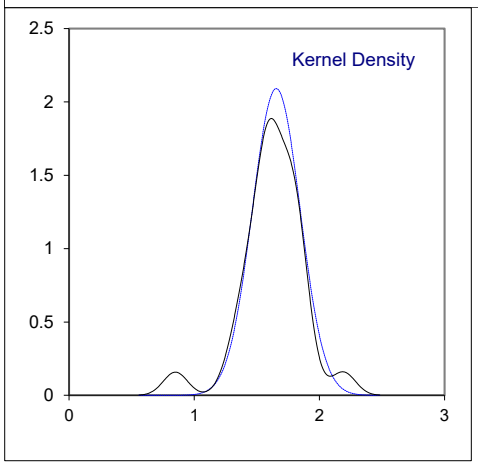


Determination of Di-Aromatic Hydrocarbons on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323	EN12916	1.4		-1.39	
328		-----		-----	
334	EN12916	1.5		-0.84	
335		-----		-----	
338		-----		-----	
343	EN12916	1.6		-0.30	
365		-----		-----	
381	EN12916	1.80		0.79	
445	IP391	1.655		0.00	
447	IP391	1.5726		-0.45	
460		-----		-----	
467	EN12916	1.575		-0.44	
496	EN12916	1.66		0.03	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026	EN12916	1.8		0.79	
1047	EN12916	1.6		-0.30	
1059	EN12916	1.9		1.34	
1065		1.82		0.90	
1124	EN12916	1.57		-0.46	
1126		1.8		0.79	
1131		-----		-----	
1134	IP391	0.85	R(0.01)	-4.39	
1140	IP391	1.73		0.41	
1146		-----		-----	
1194		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	1.820		0.90	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	EN12916	1.8		0.79	
1459	EN12916	1.43		-1.23	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	1.3		-1.93	
1811		1.53		-0.68	
2146	EN12916	1.4		-1.39	
6168		-----		-----	
6201	EN12916	1.72		0.35	
6308	IP391	2.19		2.92	
6359	EN12916	1.6		-0.30	
6370		-----		-----	
6371		-----		-----	
6373	EN12916	1.6		-0.30	

normality	suspect
n	25
outliers	1
mean (n)	1.6549
st.dev. (n)	0.19078
R(calc.)	0.5342
st.dev.(EN12916:19)	0.18348
R(EN12916:19)	0.5137

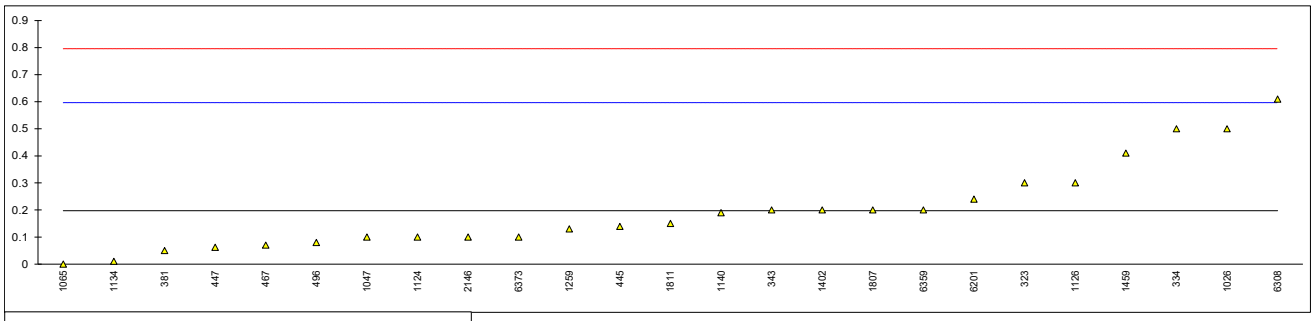


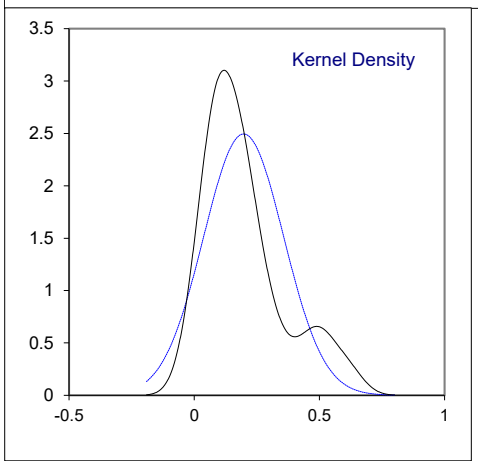


Determination of Tri+-Aromatic Hydrocarbons on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323	EN12916	0.3		0.51	
328		-----		-----	
334	EN12916	0.5		1.52	
335		-----		-----	
338		-----		-----	
343	EN12916	0.2		0.01	
365		-----		-----	
381	EN12916	0.05		-0.74	
445	IP391	0.139		-0.29	
447	IP391	0.0617		-0.68	
460		-----		-----	
467	EN12916	0.07		-0.64	
496	EN12916	0.08		-0.59	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026	EN12916	0.5		1.52	
1047	EN12916	0.1		-0.49	
1059	EN12916	<0,1		-----	
1065		0.0		-0.99	
1124	EN12916	0.10		-0.49	
1126		0.3		0.51	
1131		-----		-----	
1134	IP391	0.01		-0.94	
1140	IP391	0.19		-0.04	
1146		-----		-----	
1194		-----		-----	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	0.13		-0.34	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	EN12916	0.2		0.01	
1459	EN12916	0.41		1.06	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	0.2		0.01	
1811		0.15		-0.24	
2146	EN12916	0.1		-0.49	
6168		-----		-----	
6201	EN12916	0.24		0.21	
6308	IP391	0.61		2.07	
6359	EN12916	0.2		0.01	
6370		-----		-----	
6371		-----		-----	
6373	EN12916	0.1		-0.49	

normality	suspect
n	25
outliers	0
mean (n)	0.1976
st.dev. (n)	0.15994
R(calc.)	0.4478
st.dev.(EN12916:19)	0.19941
R(EN12916:19)	0.5584

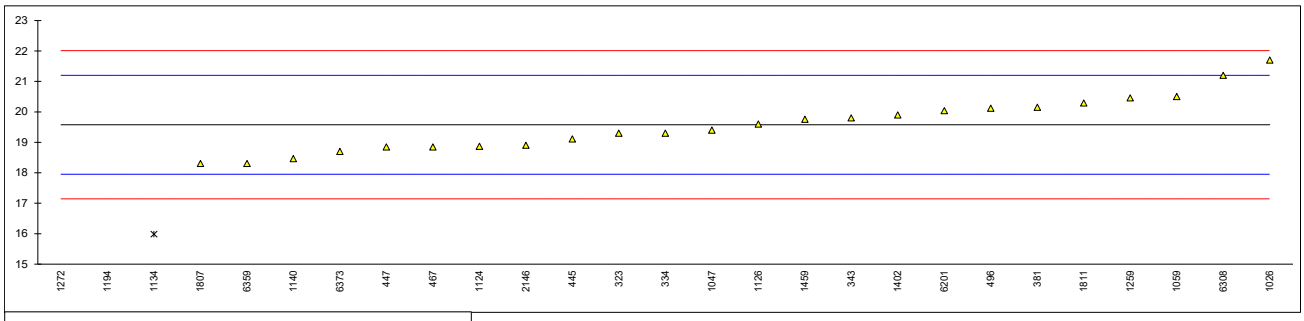


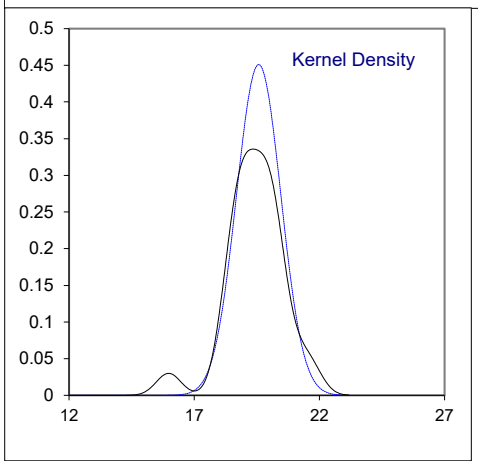


Determination of Total Aromatic Hydrocarbons on sample #21070; result in %M/M

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171		-----		-----	
175		-----		-----	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323	EN12916	19.3		-0.34	
328		-----		-----	
334	EN12916	19.3		-0.34	
335		-----		-----	
338		-----		-----	
343	EN12916	19.8		0.27	
365		-----		-----	
381	EN12916	20.15		0.71	
445	IP391	19.110		-0.58	
447	IP391	18.8495		-0.90	
460		-----		-----	
467	EN12916	18.85		-0.90	
496	EN12916	20.12		0.67	
511		-----		-----	
529		-----		-----	
541		-----		-----	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026	EN12916	21.7		2.61	
1047	EN12916	19.4		-0.22	
1059	EN12916	20.5		1.14	
1065		-----		-----	
1124	EN12916	18.87		-0.87	
1126		19.6		0.03	
1131		-----		-----	
1134	IP391	15.98	R(0.01)	-4.43	
1140	IP391	18.46		-1.38	
1146		-----		-----	
1194	EN12916	10.1	R(0.01)	-11.67	
1227		-----		-----	
1233		-----		-----	
1237		-----		-----	
1259	EN12916	20.46		1.09	
1272	EN12916	1.7	R(0.01)	-22.02	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	EN12916	19.9		0.40	
1459	EN12916	19.76		0.22	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724		-----		-----	
1728		-----		-----	
1807	EN12916	18.3		-1.57	
1811		20.29		0.88	
2146	EN12916	18.9		-0.83	
6168		-----		-----	
6201	EN12916	20.04		0.57	
6308	IP391	21.20		2.00	
6359	EN12916	18.3		-1.57	
6370		-----		-----	
6371		-----		-----	
6373	EN12916	18.7		-1.08	

normality	OK
n	24
outliers	3
mean (n)	19.577
st.dev. (n)	0.8847
R(calc.)	2.477
st.dev.(EN12916:19)	0.8119
R(EN12916:19)	2.273

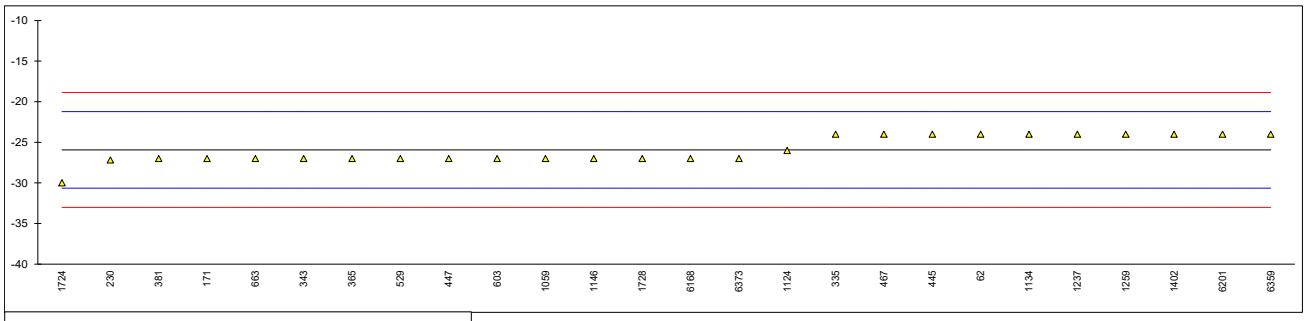


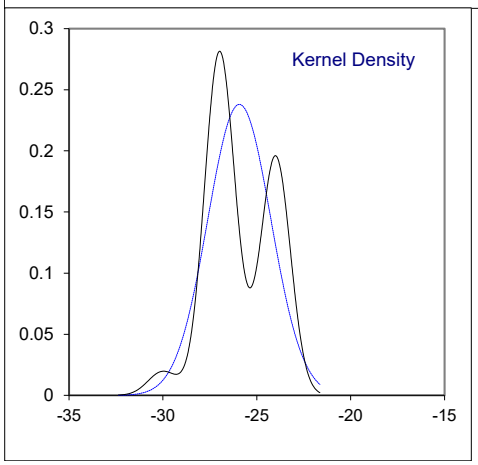


Determination of Pour Point Manual on sample #21070; results in °C

lab	method	value	mark	z(targ)	remarks
62	D97	-24		0.82	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	D97	-27		-0.45	
175		-----		-----	
230	ISO3016-manual	-27.19		-0.53	
237	D97	<-21		-----	
238		-----		-----	
323		-----		-----	
328		-----		-----	
334		-----		-----	
335	ISO3016-automated	-24		0.82	
338		-----		-----	
343	ISO3016-automated	-27	C	-0.45	First reported -36
365	IP15	-27		-0.45	
381	ISO3016-manual	-27		-0.45	
445	D97	-24		0.82	
447	IP15	-27		-0.45	
460		-----		-----	
467	ISO3016-manual	-24		0.82	
496		-----		-----	
511		-----		-----	
529	D97	-27		-0.45	
541		-----		-----	
603	D97	-27		-0.45	
621	D97	< -27.0		-----	
633		-----		-----	
663	D97	-27		-0.45	
1006		-----		-----	
1016		-----		-----	
1017		-----		-----	
1026		-----		-----	
1047		-----		-----	
1059	ISO3016-automated	-27		-0.45	
1065		-----		-----	
1124	ISO3016-automated	-26.0		-0.03	
1126		-----		-----	
1131		-----		-----	
1134	IP15	-24		0.82	
1140		-----		-----	
1146	D97	-27		-0.45	
1194		-----		-----	
1227		-----		-----	
1233	ISO3016	<-12		-----	
1237	ISO3016-automated	-24		0.82	
1259	ISO3016-manual	-24		0.82	
1272		-----		-----	
1316		-----		-----	
1339		-----		-----	
1389		-----		-----	
1402	ISO3016-manual	-24		0.82	
1459		-----		-----	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650		-----		-----	
1706		-----		-----	
1724	D97	-30		-1.73	
1728	D97	-27		-0.45	
1807		-----		-----	
1811		-----		-----	
2146		-----		-----	
6168	D97	-27		-0.45	
6201	ISO3016-manual	-24		0.82	
6308		-----		-----	
6359	ISO3016-automated	-24		0.82	
6370		-----		-----	
6371		-----		-----	
6373	ISO3016-manual	-27		-0.45	

normality	OK
n	26
outliers	0
mean (n)	-25.930
st.dev. (n)	1.6768
R(calc.)	4.695
st.dev.(ISO3016:19)	2.3571
R(ISO3016:19)	6.6

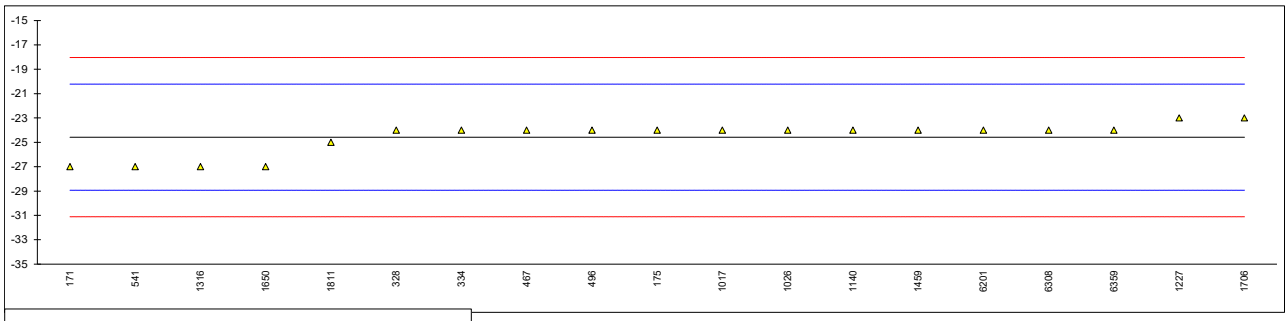


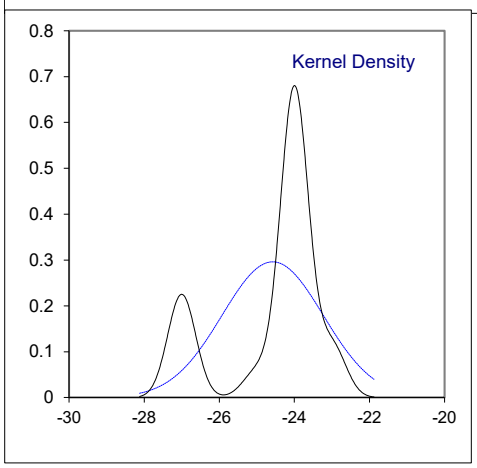


Determination of Pour Point Automated 3°C interval on sample #21070; results in °C

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120		-----		-----	
140		-----		-----	
150		-----		-----	
171	D5950	-27		-1.11	
175	D5950	-24		0.27	
230		-----		-----	
237		-----		-----	
238		-----		-----	
323		-----		-----	
328	D5950	-24		0.27	
334	D5950	-24		0.27	
335		-----		-----	
338		-----		-----	
343		-----		-----	
365		-----		-----	
381		-----		-----	
445		-----		-----	
447		-----		-----	
460		-----		-----	
467	D6892	-24		0.27	
496	D5950	-24		0.27	
511		-----		-----	
529		-----		-----	
541	D5950	-27		-1.11	
603		-----		-----	
621		-----		-----	
633		-----		-----	
663		-----		-----	
1006		-----		-----	
1016		-----		-----	
1017	D5950	-24.0		0.27	
1026	D5950	-24		0.27	
1047		-----		-----	
1059		-----		-----	
1065		-----		-----	
1124		-----		-----	
1126		-----		-----	
1131		-----		-----	
1134		-----		-----	
1140	D5950	-24		0.27	
1146		-----		-----	
1194		-----		-----	
1227	D5950	-23		0.72	
1233		-----		-----	
1237		-----		-----	
1259		-----		-----	
1272		-----		-----	
1316	D5950	-27.0		-1.11	
1339		-----		-----	
1389		-----		-----	
1402		-----		-----	
1459	In house	-24.0		0.27	
1549		-----		-----	
1550		-----		-----	
1634		-----		-----	
1650	D5950	-27.0		-1.11	
1706	D5950	-23.0		0.72	
1724		-----		-----	
1728		-----		-----	
1807		-----		-----	
1811	D5950	-25		-0.19	
2146		-----		-----	
6168		-----		-----	
6201	D5950	-24		0.27	
6308	D5950	-24		0.27	
6359	D7346	-24		0.27	
6370		-----		-----	
6371		-----		-----	
6373		-----		-----	

normality	OK
n	19
outliers	0
mean (n)	-24.579
st.dev. (n)	1.3464
R(calc.)	3.770
st.dev.(D5950:14)	2.1786
R(D5950:14)	6.1

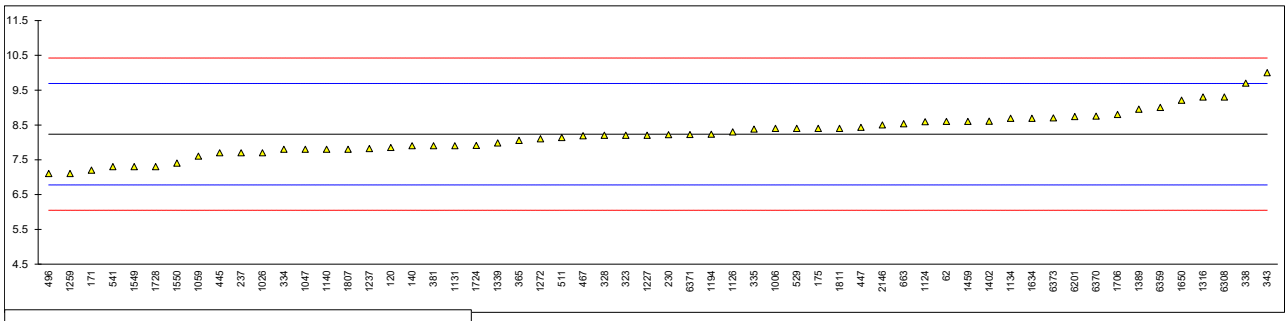


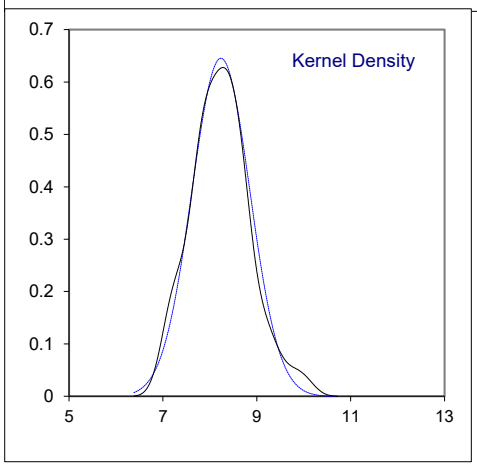


Determination of Sulfur on sample #21070; result in mg/kg

lab	method	value	mark	z(targ)	remarks
62	D5453	8.6		0.50	
120	D7039	7.85		-0.53	
140	D2622	7.9		-0.46	
150		-----		-----	
171	D5453	7.2		-1.42	
175	D5453	8.4		0.23	
230	ISO20846	8.217		-0.02	
237	D5453	7.7		-0.73	
238		-----		-----	
323	ISO20846	8.2		-0.05	
328	ISO20846	8.2		-0.05	
334	ISO20846	7.8		-0.60	
335	ISO20846	8.38		0.20	
338	ISO20846	9.70		2.01	
343	ISO20846	10		2.42	
365	IP490	8.053		-0.25	
381	ISO20846	7.9		-0.46	
445	ISO20846	7.7		-0.73	
447	IP490	8.43		0.27	
460		-----		-----	
467	ISO20846	8.19		-0.06	
496	ISO20846	7.1		-1.56	
511	D5453	8.14		-0.13	
529	D4294	8.4		0.23	
541	ISO20846	7.30		-1.28	
603		-----		-----	
621	D4294	< 20		-----	
633		-----		-----	
663	D5453	8.53		0.41	
1006	D5453	8.4		0.23	
1016		-----		-----	
1017		-----		-----	
1026	ISO20846	7.70		-0.73	
1047	ISO20846	7.8		-0.60	
1059	ISO20846	7.6		-0.87	
1065		-----		-----	
1124	ISO20846	8.590		0.49	
1126		8.3		0.09	
1131	ISO20846	7.9		-0.46	
1134	IP490	8.69		0.62	
1140	D5453	7.8		-0.60	
1146	D4294	<100	C	-----	First reported 0
1194	D7220	8.23		-0.01	
1227	D5453	8.2		-0.05	
1233	ISO8754	<300	C	-----	Reported <0.030 mg/kg
1237	ISO20846	7.82		-0.57	
1259	ISO20846	7.1		-1.56	
1272	ISO20846	8.1		-0.18	
1316	ISO13032	9.3		1.46	
1339	ISO20884	7.98		-0.35	
1389	ISO20846	8.952		0.98	
1402	ISO20846	8.61		0.52	
1459	ISO20884	8.6		0.50	
1549	ISO20884	7.3		-1.28	
1550	ISO20884	7.4		-1.14	
1634	ISO20846	8.69		0.62	
1650	ISO20846	9.21		1.34	
1706	ISO20846	8.8		0.78	
1724	D5453	7.91		-0.44	
1728	D5453	7.3		-1.28	
1807	ISO20846	7.8		-0.60	
1811	ISO20846	8.40		0.23	
2146	ISO20846	8.5		0.36	
6168		-----		-----	
6201	D5453	8.74		0.69	
6308	IP490	9.3		1.46	
6359	ISO20846	9.0		1.05	
6370	ISO20884	8.75		0.71	
6371	ISO20884	8.223		-0.02	
6373	ISO20846	8.7		0.64	

normality	OK
n	58
outliers	0
mean (n)	8.234
st.dev. (n)	0.6183
R(calc.)	1.731
st.dev.(ISO20846:19)	0.7294
R(ISO20846:19)	2.042

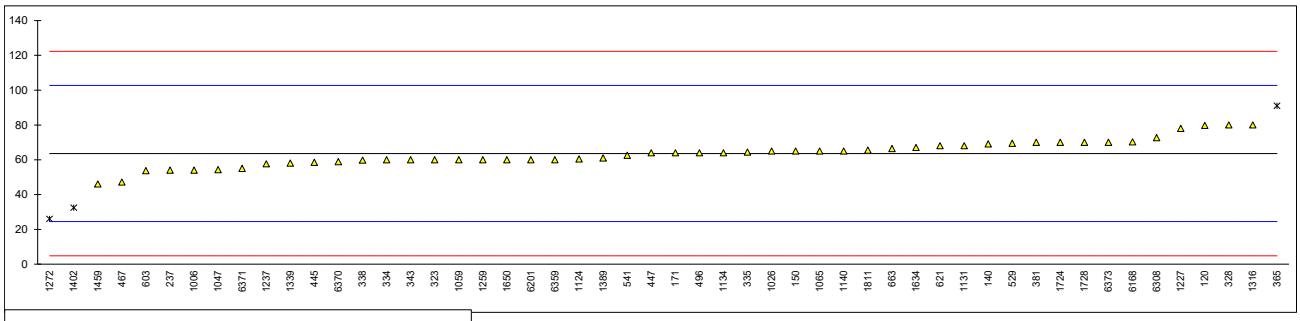


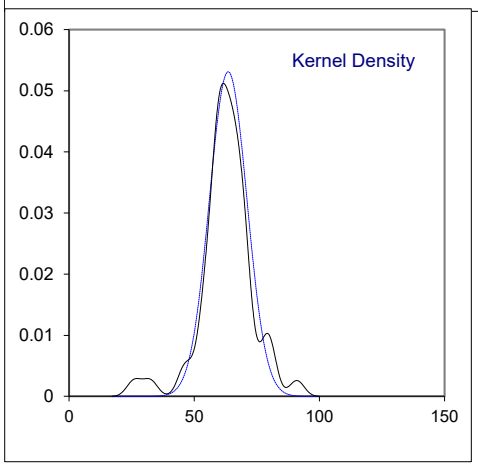


Determination of Water on sample #21070; result in mg/kg

lab	method	value	mark	z(targ)	remarks
62		-----		-----	
120	E203	79.7		0.82	
140	D6304-A	69		0.28	
150	D6304-A	65.0		0.07	
171	D6304-A	64		0.02	
175		-----		-----	
230	ISO3733	<500	C	-----	First reported <0.1 mg/kg
237	D6304-C	54		-0.49	
238		-----		-----	
323	ISO12937	60		-0.18	
328	ISO12937	80		0.84	
334	ISO12937	60		-0.18	
335	ISO12937	64.4		0.04	
338	ISO12937	59.7		-0.20	
343	ISO12937	60		-0.18	
365	IP438	91.0	R(0.05)	1.40	
381	ISO12937	70		0.33	
445	ISO12937	58.5		-0.26	
447	IP438	64		0.02	
460		-----		-----	
467	ISO12937	47.1		-0.84	
496	ISO12937	64		0.02	
511		-----		-----	
529	D6304-A	69.495		0.30	
541	ISO12937	62.5		-0.05	
603	D6304-A	53.7		-0.50	
621	D6304-B	68		0.23	
633		-----		-----	
663	D6304-A	66.4		0.14	
1006	D6304-A	54		-0.49	
1016		-----		-----	
1017		-----		-----	
1026	D6304-B	65		0.07	
1047	ISO12937	54.2		-0.48	
1059	ISO12937	60		-0.18	
1065	D6304-A	65		0.07	
1124	ISO12937	60.41		-0.16	
1126		-----		-----	
1131	ISO12937	68		0.23	
1134	ISO12937	64		0.02	
1140	IP438	65		0.07	
1146	D6304-C	<100	C	-----	First reported <0.01 mg/kg
1194		-----		-----	
1227	D6304-A	78		0.74	
1233	E203	<500	C	-----	Reported <0.05 mg/kg
1237	ISO12937	57.6		-0.30	
1259	ISO12937	60		-0.18	
1272	ISO12937	26	C,R(0.05)	-1.92	Reported 0.0026 mg/kg
1316	ISO12937	80		0.84	
1339	ISO12937	58		-0.28	
1389	ISO12937	61.03		-0.13	
1402	ISO12937	32.42	R(0.05)	-1.59	
1459	ISO12937	46		-0.90	
1549		-----		-----	
1550		-----		-----	
1634	ISO12937	67.0		0.18	
1650	ISO12937	60		-0.18	
1706		-----		-----	
1724	D6304-A	70		0.33	
1728	E203	70		0.33	
1807		-----		-----	
1811	ISO12937	65.5		0.10	
2146		-----		-----	
6168	D6304-A	70.2		0.34	
6201	ISO12937	60		-0.18	
6308	IP438	72.6751		0.46	
6359	D6304-A	60		-0.18	
6370	ISO12937	58.86		-0.24	
6371	ISO12937	54.98		-0.44	
6373	ISO12937	70		0.33	

normality	OK
n	49
outliers	3
mean (n)	63.570
st.dev. (n)	7.5121
R(calc.)	21.034
st.dev.(ISO12937:00)	19.5825
R(ISO12937:00)	54.831



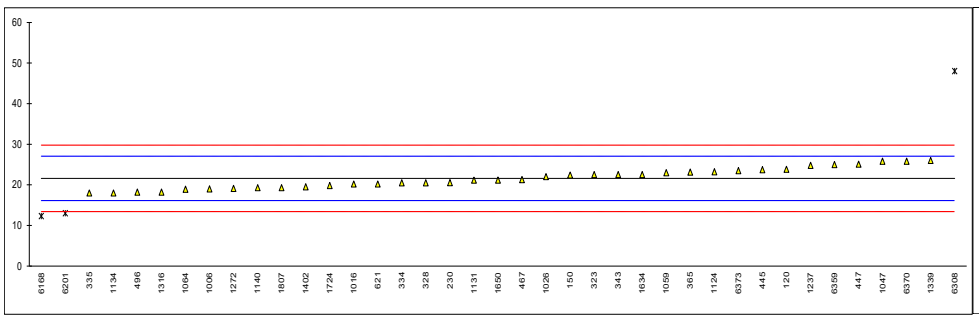


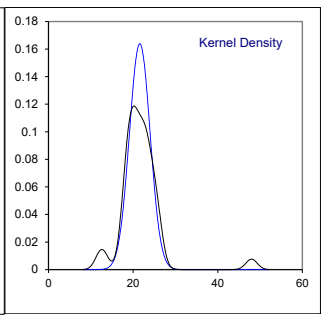
Determination of Total Contamination on sample #21071; result in mg/kg

lab	method	value	mark	z(targ)	Complete filtration	Volume used (mL)	filtration stopped after minutes
120	EN12662:2014	23.83	C	0.81	Yes	300	Not Stopped
140		-----		-----		n	-----
150	EN12662:2014	22.4	C	0.29	Yes	300	-----
171	EN12662	<12	f-?	<-3.51		300	-----
230	D6217	20.520		-0.40		960	<30
323	EN12662:2014	22.5		0.33	Yes	300	-----
328	EN12662:2014	20.5		-0.40	Yes	300	-----
334	EN12662:2014	20.5		-0.40	Yes	300	-----
335	EN12662:2014	18.0		-1.32	Yes	n	-----
343	EN12662:2014	22.5		0.33		n	-----
365	IP440	23.151		0.57	Yes	410	-----
445	EN12662:1998	23.72		0.77	Yes	291	-----
447	IP440	25.1		1.28	Yes	306	-----
467	EN12662:2014	21.27		-0.12	Yes	300	1
496	EN12662:2014	18.20		-1.24	Yes	n	-----
621	EN12662:2014	20.2		-0.51	Yes	300	5
663		-----		-----		n	-----
1006	EN12662:2014	19		-0.95	Yes	300	-----
1016	EN12662:2014	20.198		-0.51	Yes	331.48	-----
1026	EN12662:2014	22		0.15	Yes	845	-----
1047	EN12662:2014	25.8		1.53	Yes	300	-----
1059	EN12662:2014	23.0		0.51	Yes	300	-----
1064	EN12662:2014	18.94		-0.97	Yes	300	-----
1124	EN12662:2014	23.19		0.58	Yes	2 X 300	-----
1131	EN12662:2014	21.14		-0.17	Yes	n	-----
1134	EN12662:2014	18.0		-1.32	Yes	n	-----
1140	IP440	19.3		-0.84		n	-----
1237	EN12662:2014	24.8		1.17	Yes	n	-----
1272	EN12662:2014	19.1		-0.91	Yes	300	1.25
1316	EN12662:2014	18.2		-1.24	Yes	300	-----
1339	EN12662:2014	26.0		1.61	Yes	300	-----
1402	IP440	19.5		-0.77	Yes	300ml	-----
1634	EN12662:2014	22.5		0.33	Yes	n	-----
1650	EN12662:2014	21.16		-0.16	Yes	n	-----
1724	IP440	19.84		-0.64		n	-----
1807	EN12662:2014	19.3		-0.84		n	-----
6168	D7321	12.28	R(0.05)	-3.41	Yes	800	4
6201	EN12662:2014	13	R(0.05)	-3.14	Yes	300.5	-----
6308	EN12662:2014	48	R(0.01)	9.65	Yes	400	-----
6359	EN12662:2014	25		1.24		n	-----
6370	EN12662:2014	25.8	C	1.53	Yes	300	-----
6371		-----		-----		n	-----
6373	EN12662:2014	23.5	C	0.69	Yes	353	-----

normality	OK
n	36
outliers	3
mean (n)	21.602
st.dev. (n)	2.4327
R(calc.)	6.812
st.dev.(EN12662:14)	2.7365
R(EN12662:14)	7.662

Lab 120: first reported 66.77
Lab 150: first reported <12.0
Lab 171: reported possibly a false negative test result?
Lab 6370: first reported 44.9
Lab 6373: first reported 10





APPENDIX 2

z-scores Distillation

lab	IBP	10% rec	50% rec	90% rec	95% rec	FBP
62	0.71	0.62	1.79	0.89	1.32	1.06
120	0.99	0.03	1.23	0.50	-----	0.51
140	0.10	-0.04	-0.73	-0.56	-0.32	-0.76
150	-1.53	-1.22	-2.41	-1.67	-1.47	-2.29
171	0.28	10.79	8.79	0.73	-0.16	-0.20
175	0.13	-0.96	0.58	1.23	1.32	0.27
230	-0.30	1.22	0.86	0.67	0.47	-1.19
237	0.65	-0.50	0.20	-1.84	-2.02	-0.44
238	-0.58	-1.16	0.20	1.50	0.60	1.53
323	1.51	0.82	-0.08	0.50	0.86	0.07
328	-0.61	-1.03	-0.64	-0.56	-0.52	-0.68
334	-0.61	-1.29	-0.54	-0.56	0.04	-0.72
335	-0.12	-0.83	0.86	1.17	1.45	0.39
338	1.66	1.35	1.51	0.28	0.27	0.78
343	0.03	-----	-0.73	-0.05	0.14	1.02
365	-1.59	-0.83	-1.20	-0.67	-0.55	-0.56
381	0.53	-1.62	2.07	1.56	0.34	-1.54
445	-1.56	-0.10	-0.73	-0.22	0.07	-0.68
447	-0.55	-0.37	0.02	0.11	0.17	0.55
460	-----	-----	-----	-----	-----	-----
467	0.16	-0.23	-0.17	-0.89	-0.29	-0.76
496	-0.52	-0.10	-1.01	-0.61	-0.42	-0.05
511	-----	-----	-----	-----	-----	-----
529	-1.19	0.36	0.95	0.45	0.63	-0.16
541	0.36	-0.07	0.25	-0.17	0.07	-0.03
603	-----	-----	-----	-----	-----	-----
621	0.65	-0.50	0.20	6.52	1.58	-0.44
633	-1.04	-2.55	-2.13	-0.39	-0.71	-3.12
663	-----	-----	-----	-----	-----	-----
1006	0.53	0.69	0.48	-0.72	-0.78	-0.24
1016	-----	-----	-----	-----	-----	-----
1017	-----	-----	-----	-----	-----	-----
1026	0.56	-0.04	0.48	0.22	0.27	-0.12
1047	1.26	0.29	1.14	1.00	0.93	0.70
1059	0.49	-0.10	-0.08	-0.17	0.07	0.31
1065	-----	-----	-----	-----	-----	-----
1124	0.65	-0.50	0.67	-0.17	-0.71	0.15
1126	5.13	0.82	0.20	-0.05	-0.45	0.82
1131	0.10	0.56	0.67	0.50	0.70	-0.48
1134	-0.52	0.29	0.95	0.28	0.37	0.07
1140	-1.59	-1.42	-2.32	-1.33	-1.07	-1.23
1146	0.46	0.03	0.02	-0.44	-0.78	0.39
1194	-----	-----	-----	-----	-----	-----
1227	-0.12	0.29	-0.08	-0.11	-0.06	0.31
1233	-----	-----	-----	-----	-----	-----
1237	0.49	0.82	0.58	-0.33	-0.29	-0.01
1259	-0.21	0.43	-1.10	-1.33	-1.27	-0.56
1272	-1.56	-1.09	-0.92	0.34	0.63	-0.09
1316	-0.67	0.56	-0.36	-0.56	-0.78	-0.24
1339	0.07	-1.59	-0.92	-0.75	-0.45	-0.28
1389	-----	-----	-----	-----	-----	-----
1402	0.34	0.43	-0.08	-0.50	-0.32	0.11
1459	0.03	0.10	-0.36	-1.00	-0.68	-0.48
1549	1.17	2.60	8.42	2.12	1.65	1.61
1550	0.34	2.01	8.23	1.89	1.52	1.81
1634	-0.15	0.56	-0.17	-0.44	-0.29	0.55
1650	-1.19	-0.04	0.58	0.06	-0.02	-0.12
1706	1.06	1.05	1.18	0.09	0.11	0.23
1724	0.40	0.76	0.20	-0.11	-0.19	0.19
1728	-0.27	-0.17	0.20	-0.17	0.27	-0.44
1807	0.71	-0.37	-1.94	-1.17	-1.14	-0.12
1811	-0.40	0.82	-0.36	-0.61	-0.91	-0.40
2146	-0.58	-0.50	-0.64	-0.33	0.30	-0.05
6168	1.72	3.86	1.32	1.95	1.38	1.22
6201	-0.40	-0.10	0.02	0.00	-0.02	0.03
6308	0.16	1.61	-1.20	-0.50	-0.22	-0.36
6359	-0.58	1.15	0.48	-0.22	-0.25	0.39
6370	-1.23	-0.52	0.11	1.04	1.66	0.03
6371	1.78	0.32	1.30	0.30	-2.39	-0.89
6373	0.11	-0.22	-0.28	-0.36	0.89	-0.10

APPENDIX 3

Number of participants per country

1 lab in ARGENTINA
1 lab in AUSTRIA
3 labs in BELGIUM
2 labs in BULGARIA
1 lab in CANADA
1 lab in CROATIA
1 lab in CYPRUS
1 lab in CZECH REPUBLIC
1 lab in FINLAND
5 labs in FRANCE
2 labs in GERMANY
1 lab in GREECE
1 lab in INDONESIA
1 lab in IRELAND
1 lab in ISRAEL
1 lab in LATVIA
1 lab in LITHUANIA
1 lab in MACEDONIA
1 lab in MALAYSIA
1 lab in MAURITIUS
1 lab in MEXICO
5 labs in NETHERLANDS
2 labs in NIGERIA
2 labs in PERU
1 lab in PHILIPPINES
2 labs in POLAND
2 labs in PORTUGAL
3 labs in ROMANIA
2 labs in SERBIA
2 labs in SLOVENIA
3 labs in SPAIN
2 labs in SWEDEN
1 lab in TAIWAN
1 lab in THAILAND
1 lab in TURKEY
8 labs in UNITED KINGDOM
5 labs in UNITED STATES OF AMERICA

APPENDIX 4

Abbreviations

C = final test result after checking of first reported suspect test result
D(0.01) = outlier in Dixon's outlier test
D(0.05) = straggler in Dixon's outlier test
G(0.01) = outlier in Grubbs' outlier test
G(0.05) = straggler in Grubbs' outlier test
DG(0.01) = outlier in Double Grubbs' outlier test
DG(0.05) = straggler in Double Grubbs' outlier test
R(0.01)/R(1) = outlier in Rosner's outlier test
R(0.05)/R(5) = straggler in Rosner's outlier test
E = calculation difference between reported test result and result calculated by iis
W = test result withdrawn on request of participant
ex = test result excluded from statistical evaluation
n.a. = not applicable
n.e. = not evaluated
n.d. = not detected
fr. = first reported
SDS = Safety Data Sheet

Literature

1. iis Interlaboratory Studies, Protocol for the Organisation, Statistics & Evaluation, June 2018
2. ISO5725:86
3. ISO5725 parts 1-6:94
4. ISO13528:05
5. M. Thompson and R. Wood, J. AOAC Int, 76, 926, (1993)
6. W.J. Youden and E.H. Steiner, Statistical Manual of the AOAC, (1975)
7. P.L. Davies, Fr. Z. Anal. Chem, 331, 513, (1988)
8. J.N. Miller, Analyst, 118, 455, (1993)
9. Analytical Methods Committee, Technical Brief, No 4, January 2001
10. P.J. Lowthian and M. Thompson, The Royal Society of Chemistry, Analyst, 127, 1359-1364, (2002)
11. W. Horwitz and R. Albert, J. AOAC Int, 79.3, 589-621, (1996)
12. Bernard Rosner, Percentage Points for a Generalized ESD Many-Outlier Procedure, Technometrics, 25(2), 165-172, (1983)
13. iis memo 1904 Precision data of Calculated Cetane Index Four Variables in Gasoil